

Green Zia Environmental Excellence Program Achievement-level Application: Los Alamos National Laboratory FACILITY MANAGEMENT UNIT-75

Nonproliferation and International Security

FMU-75



Los Alamos

NATIONAL LABORATORY

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Green Zia Environmental Excellence Program

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Green Zia Environmental Excellence Program

Achievement-level Application:

Los Alamos National Laboratory

FACILITY MANAGEMENT UNIT-75

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Green Zia Environmental Excellence Program Achievement-level Application: Los Alamos National Laboratory FACILITY MANAGEMENT UNIT-75

0 ORGANIZATIONAL OVERVIEW

0.1 BASIC ORGANIZATIONAL DESCRIPTION

Los Alamos National Laboratory (LANL) is owned by the US Department of Energy (DOE) and operated under contract by the University of California (UC). Established in 1943 as part of the Manhattan Project, LANL's original mission was to design, develop, and test nuclear weapons. As technologies, US priorities, and the world community have changed, LANL's mission has broadened to enhancing global security by ensuring safety and confidence in the US nuclear weapons stockpile, developing technical solutions to reduce the threat of weapons of mass destruction, and improving the environmental and nuclear materials legacy of the Cold War. In addition, LANL applies its scientific and engineering capabilities to assist the nation in addressing energy, environment, infrastructure, and biological security problems.

LANL occupies a 43-square-mile enclave in Los Alamos County, New Mexico. Real estate on the site is divided into 47 administrative units known as technical areas (TAs). Programmatically, LANL is composed of about 30 major organizations, called divisions. Each division has a director, group leaders, and team leaders. Divisions typically serve as the landlords of facilities where LANL programmatic work is carried out. Facility management services at a given division are performed by one or more facility management units (FMUs), of which about 17 exist at the Laboratory. TAs and FMUs are not normally coterminous. Several FMUs may own facilities at a single TA. An FMU may own facilities at several widely dispersed TAs.

A division often finds it convenient to carry out work in a facility owned by another division. Therefore, it is not unusual at LANL for an FMU to lease out space in its facilities to tenant organizations representing several divisions.

Such is the case with FMU-75, which was organized in 1995. We are a constituent group of the Nonproliferation and International Security Division (NIS). A total of twelve groups comprise NIS; ten of them are programmatic, and two of them are FMUs—namely, FMU-74 and FMU-75. The chief officers of NIS FMUs function administratively as Group Leaders and operationally as Facility Managers. Facility Coordinators—of which there are four in FMU-75—have charge of specific facilities and report directly to the Facility Manager.

FMU-75 owns facilities at TA-3, -33, -35, -52, and -66, encompassing about 210,000 gross leasable square feet. We provide facility management services to about 8 NIS groups as well as to about 36 tenants from 13 other LANL organizations, including those from the Computer, Communications, and Networking Division, the Technical Safety Assessment Division, the Center for International Security Affairs, and the Space Science Laboratory.

The mission of NIS is critical to the nation's security—detect and deter the proliferation of weapons of mass destruction. Accordingly, NIS pursues strategies to apply preeminent science and technology capabilities in such fields as nuclear materials and facilities monitoring, nuclear test detection, remote and *in situ* sensing, assessment of arms-control treaties, advanced computational analysis, and space science.

The FMU-75 mission supports that of our parent division, NIS, by

- managing NIS and tenant facilities: We provide a safe and effective, well maintained work space for the tenants. We continuously monitor the space to be sure it meets the needs of the occupants.
- identifying the safety envelope for facility operations: All work is done within the confines of a written safety agreement. This agreement sets limits as to what can be done in the spaces and surrounding environment.
- supervising the physical security of facilities: Some areas are secure and have a limited access. The FMU maintains this space for the people doing classified work.

- planning for future facilities: The FMU is constantly looking to future projects and assures that there will be space for the projects. Each future project is reviewed to be sure it will fit into the existing space and be safe and environmentally compatible with present work and conditions.

See Figure 0-1 for an organization chart showing the relationship between NIS and FMU-75 and responsibilities for the business processes discussed above.

The FMU-75 team is responsible for Green Zia action and/or P2E2 initiatives. These issues are discussed at weekly all-hands meetings and at twice-weekly group meetings. Every new project or initiative is screened, using the LANL Environment, Safety, and Health Identification (ESH-ID) process discussed in Category 4.

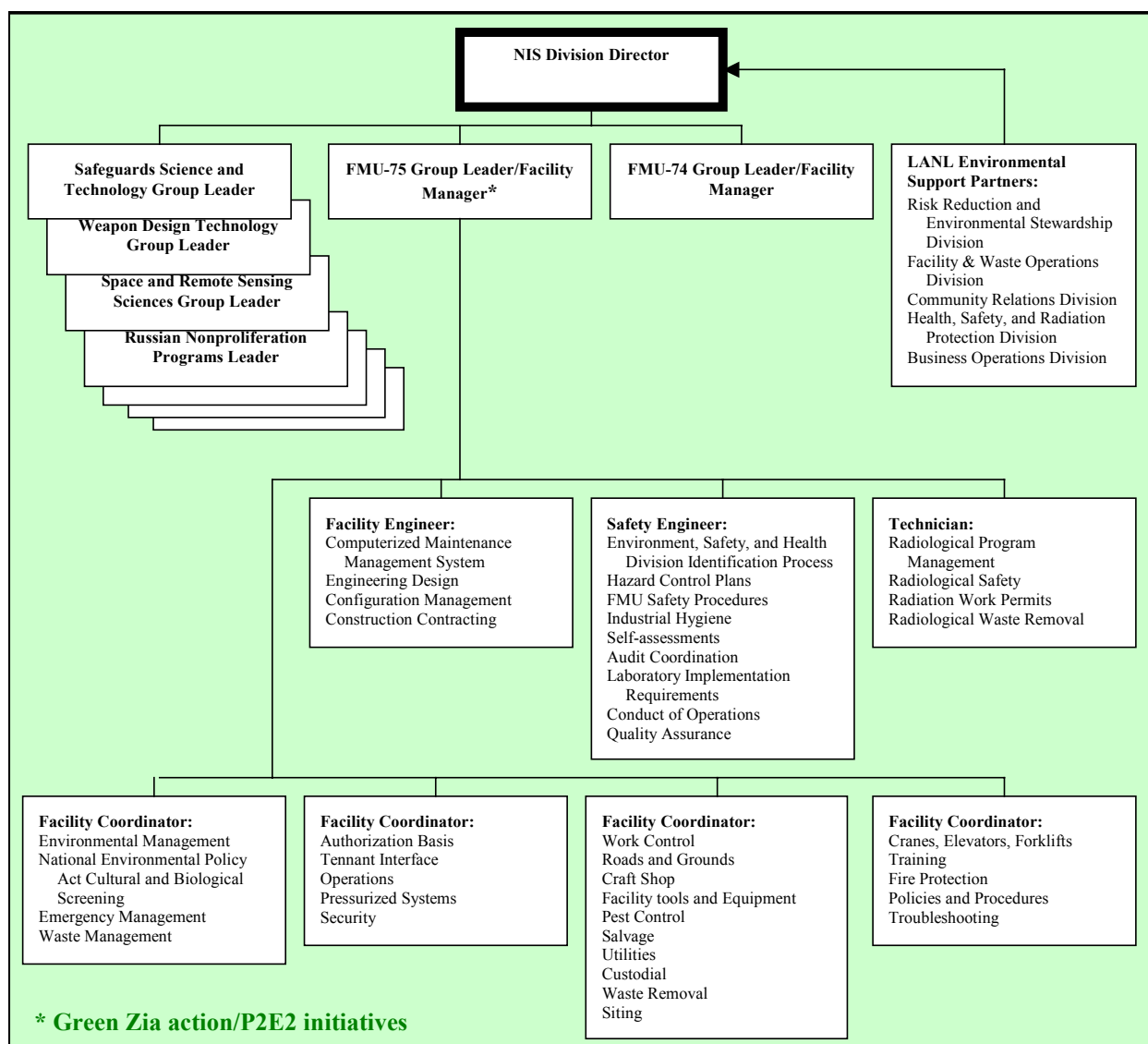


Figure 0-1. FMU-75 organizational chart and environmental support partners.

Environmental management is a core value at FMU-75 and is subject to our continuous quality improvement (CQI) program. That is, feedback on our pollution prevention (P2) and energy efficiency (E2) efforts is

- incorporated into our key business practices
- self-reinforcing
- generates action plans

See Figure 0-2 for a high-level process map of the FMU-75 environmental management system. Our environmental management system is the Laboratory-wide Integrated Safety Management (ISM) system, which is discussed in Items 1.1, 2.3, and 6.2.

An inter-organization body at LANL, called the E in ISM Team, is specifically charged with promoting environmental values in the ISM system.

Federal regulatory agencies with environmental oversight for various LANL operations include the Environmental Protection Agency (EPA), DOE, the Occupational Safety and Health Administration (OSHA), and the Nuclear Regulatory Commission (NRC). The New Mexico Environment Department (NMED) also oversees and regulates LANL activities. Many waste-management operations at LANL are governed by provisions of the Resource Conservation and Recovery Act. Further, the National Environmental Policy Act (NEPA) has mandated the development of the LANL Sight-wide Environmental Impact Statement (SWEIS).

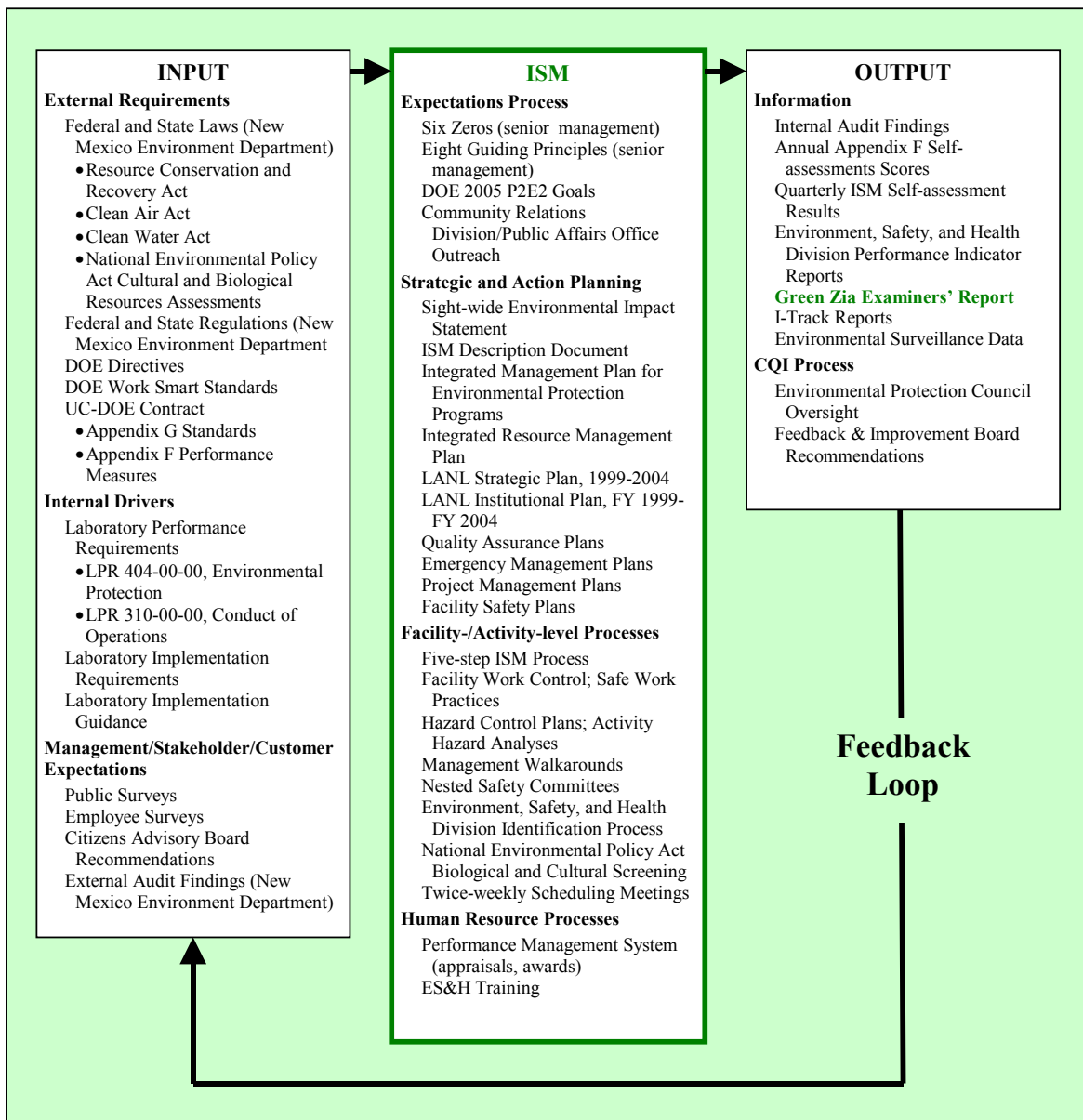


Figure 0-2. The FMU-75 environmental management system.

LANL operations—including those of FMU-75—are shaped and evaluated by operating contract requirements negotiated by DOE, UC, and LANL. By agreement of the signatories, legal and regulatory standards are made a part of the contract by reference in Appendix G, as are work-related standards culled from, e.g., the Code of Federal Regulations, the American National Standards Institute, and the Uniform Building Code. Performance measures incorporated into the UC-DOE operating contract are contained in Appendix F and provide a broad range of specific goals, measures, and evaluation criteria. Appendix G standards and F performance measures are revised annually.

Appendix F serves as a key method of determining both customer expectations and organizational performance. The contractual provisions that constitute critical measures of NIS and FMU-75 performance in the environmental arena are set forth in Item 2.3. Contractual provisions 1-3.1.a and 2-1.2.c.1 explicitly call out as a scoring criterion the application of Green Zia tools to identify P2E2 opportunities. Provision 3 enhances ISM environmental components by making managers accountable for implementing environmental management systems, leadership programs, and pollution-prevention audits, so as to meet requirements of Executive Order 13148, Greening of the Government through Leadership in Environmental Management, April 22, 2000. Items 0.4, 2.3, 3.1, and 6.2 and Categories 4 and 7 provide details on the Appendix F process.

Regulatory agencies provide feedback on the Laboratory's, and FMU-75's, compliance with environmental requirements through external audits, a process that is often mediated by the LANL Risk Reduction Environmental Stewardship Division (RRES).

But mere compliance is not LANL's goal, nor is it DOE's. Appendix F performance measures in the UC-DOE operating contract drive us beyond compliance, to P2E2 excellence. Feedback on Appendix F performance measures is provided by NIS Quarterly Appendix F Self-assessments, which, along with quarterly self-assessments from across the Laboratory, funnel into LANL Annual Appendix F Self-assessments, a process mediated by the high-level-management Feedback & Improvement Board (F&IB). Ultimately, UC and DOE conduct evaluations of LANL's Appendix F performance to determine whether provisions of the management contract are being met.

Operating costs for LANL totaled \$1.409 billion and about \$142 million for NIS Division in FY01. FY01 operating costs for FMU-75 were \$3.7 million, or about 2.6% of the NIS total. FMU-75 operating costs for FY02 are projected to be about \$3.6 million.

At the start of FY02, the LANL workforce consisted about 7970 full-time-equivalent UC employees and about 1110 full-time-equivalent contract employees. The NIS workforce consisted about 700 full-time-equivalent UC employees and about 50 full-time-equivalent contract employees. FMU-75 employs 24 workers, a little over 3% of the NIS workforce. Figure 0-3 shows overall FMU-75 workforce composition, and Figure 0-4 shows the distribution of the workforce across key and support processes.

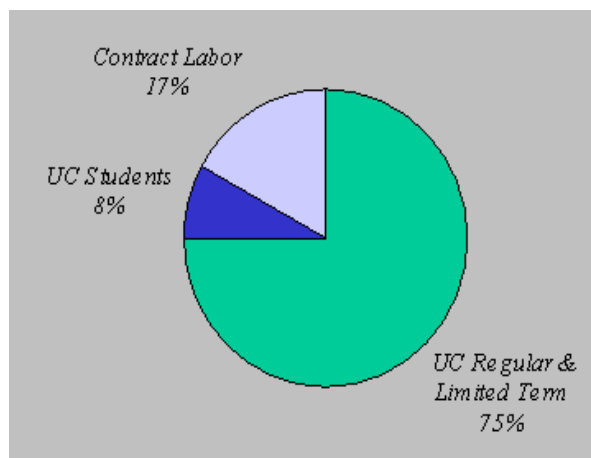


Figure 0-3. FMU-75 workforce composition.

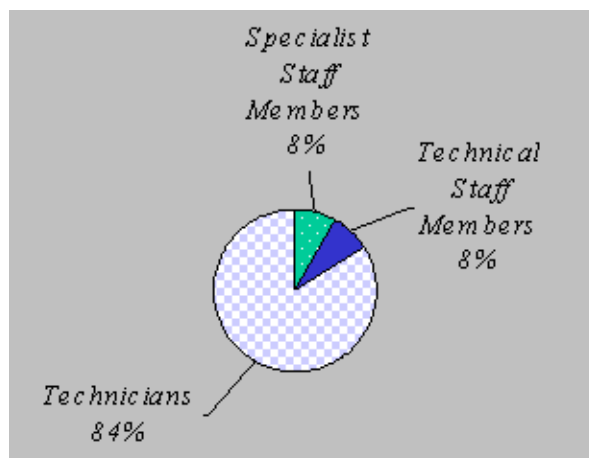


Figure 0-4. Distribution of workforce across processes.

The FMU-75 workforce is composed of 20% female employees and 80% male. Educational levels are

- 60% no college
- 10% associate degrees
- 20% bachelors degrees
- 10% advanced degrees

0.2 CUSTOMER AND STAKEHOLDER REQUIREMENTS

The DOE, for whom UC operates LANL, is the ultimate customer for FMU-75. All products and services are designed, either directly or indirectly, to carry out that portion of DOE's mission assigned to the Laboratory. In addition, the FMU has identified additional groups of stakeholders:

- FMU employees
- LANL customers, especially NIS tenants and tenants from other divisions
- cooperating agencies doing work at LANL, including the Department of Defense, various branches of the armed forces, the Defense Intelligence Agency, the Central Intelligence Agency, and the Federal Bureau of Investigation
- external stakeholders, such as UC and the surrounding communities and pueblos

Each group of stakeholders has a specific set of environmental expectations for FMU-75, as Table 0-1 shows. Those expectations inform our commitment to safe operations—including ergonomics—and efforts to minimize sanitary waste generation and resource consumption.

Table 0-1. FMU-75's Key Stakeholder Segments and Requirements Related to Environment

Stakeholder Segment	Key Environmental Requirements	Driver
DOE	Use good business practices (cost effective, timely, productive). Help LANL meet key environmental goals.	Appendix F DOE Orders OSHA Requirements
FMU Employees	Provide a safe and healthy work environment. Help LANL meet key environmental goals.	Appendix F LANL Goals OSHA Requirements
LANL Customers	Use good business practices (cost effective, timely, productive). Help LANL meet key environmental goals.	Appendix F LANL Goals
Cooperating Agencies	Use good business practices (cost effective, timely, productive).	Appendix F DOE Orders OSHA Requirements
External Stakeholders	Use good business practices (cost effective, timely, productive). Help LANL meet key environmental goals.	NMED Requirements NEPA

In addition to the measures included in Appendix F, FMU-75 uses a variety of LANL institutional systems to structure our operations. LANL's ISM system, in its broadest definition, serves as a basis for the institution's environmental management system (see Items 0.1, 1.1, 2.3, and 6.2). ISM, launched in 1996, is fully implemented. However, founded as it is on the CQI principle, improvement opportunities are systematically identified and addressed.

LANL's Performance Management System (see Item 5.1) helps leaders establish clear performance expectations for employees and ensures those expectations are aligned with organizational goals and values. LANL mechanisms such as the annual Employee Checkpoint Survey (Items 5.3 and 7.2) and the Upward Appraisal Program (Items 5.2 and 7.2) also allow FMU-75 leaders to evaluate customer/stakeholder satisfaction with FMU performance.

FMU-75's major means of interaction with the customer to address environmental needs is the ESH-ID (see Category 4) system. Every new and existing program has been reviewed at least once using the ESH-ID system. Most projects are reviewed at the proposal stage, when a project or program is looking for funding, others, before funding is accepted for the project or program. Each project or program is re-reviewed before it receives additional funding.

The major facilities managed by FMU-75 include office space, light laboratories, and warehouses. We manage facilities in both open and secure areas. None of the facilities we manage have energy requirements beyond what might be termed light-industrial.

0.3 SUPPLIER AND P2E2-PARTNERING RELATIONSHIPS

LANL is aggressively moving towards enhancing environment in the ISM system. Consistent with an integrated system, direct responsibility and accountability for managing the FMU-75's environmental, safety, and health (ES&H) practices are shared with other LANL partner organizations. Throughout this application, we identify where spheres of responsibility and accountability for FMU ES&H practices are shared. Accordingly, when application criteria present an area to consider, we cite not only our own activities but also relevant activities carried out by partner organizations.

Over half of LANL's \$1.409 billion operating budget is for the acquisition of goods and services necessary for operations. LANL's Business Operations Division (BUS) is responsible for the oversight of these major subcontracts. FMU-75's key suppliers are the approximately 20 vendors managed by the Just-In-Time (JIT) Program, which accounts for 71% of all institutional procurement transactions annually and the labor contract companies who augment the workforce.

BUS Division manages all supplier relationships under terms of the supplier contracts. Because key suppliers' performance directly affects the FMU and the entire Laboratory, quality expectations and performance requirements are clearly communicated. BUS Division representatives meet frequently and regularly with supplier representatives to evaluate performance and provide systematic, detailed feedback. One performance measure in Appendix F also measures BUS Division's ability to evaluate the overall performance of suppliers.

The Laboratory is moving in the direction of incorporating environmental components in many of the JIT product and labor contracts. Where applicable, BUS Division affirmative procurement experts ensure that routine products conform to any applicable environmental provisions, such as recycled content. Examples of JIT contracts that include a recycling requirement include those for toner cartridges, photocopy paper, and daytime calendars.

All major purchases are discussed in one of our twice-weekly meetings. All products are looked at to see how easily they can be disposed of when we are done with them. We look to see what products with recycled content can be purchased and what can again be recycled after use. We look at what can be purchased with the least amount of packaging so we do not add to the landfill before the product is used. All outside contractors for major work, such as adding a new roof, electrical upgrades, and fire alarm installation, are run through the ESH-ID process so that we know all hazards and waste streams before the job starts. In our group meetings, all employees take part in reviewing and making suggestions to make all work as environmentally-friendly as possible.

0.4 COMPETITIVE SITUATION

FMU-75 provides a set of services for our customers. The laboratory has several facility management groups which provide similar services to different customers. The services are rated on a standardized FMU report card, keyed to a maintenance index mandated in Appendix F. We can compare our service to other laboratory organizations doing similar work, and, further, we can compare our performance against measures stipulated in Appendix F of the Laboratory's operating contract. We also promote internal competition among the different sites in our FMU. Different sites have a different Facility Coordinator, and each coordinator champions projects that will benefit the tenants of his/her site. As part of our weekly meetings, we make proposals for what work will be done with a pool of money available to our group. We have to show what work we are doing, how we looked at cost and time, and how we managed environmental concerns.

Because both DOE and UC use the Appendix F measures to evaluate performance at all three research and development laboratories managed by UC—LANL, Lawrence Livermore National Laboratory (LLNL), and Lawrence Berkeley National Laboratory (LBNL)—the annual evaluations provide a means of comparing performance levels among the three institutions. Although not all Appendix F measures are applicable to all three



laboratories, the side-by-side evaluation each year does provide useful relative information. Thus, as evaluated by key customers through Appendix F, both LBNL and LLNL can be generally considered competitors against which the Laboratory can benchmark its performance. Appendix F of the three UC-DOE laboratory contracts serves to standardize green requirements among these institutions and affects competition for funding.

In a drive to incorporate best-in-class practices from the private sector into useful benchmarks, LANL has initiated its Internal Performance Indicators Program (see Item 4.1).

0.5 STRATEGIC CONTEXT

Recent improvements to the institutional ISM System (see Items 0.1, 1.1, 2.3, and 6.2) also allow all LANL units, including FMU-75, to provide input to the Laboratory's identification of most significant environmental issues. Similarly, the ISM System allows key institutional issues related to the environment to become the focus of all work units, including FMU-75.

FMU-75 has also begun focusing on several environmental thrusts recently implemented across LANL:

- recycling of unwanted mail through a process coordinated in BUS mail services
- paper reduction through double-sided copying, use of recycled paper, and use of electronic documents
- general recycling through increased emphasis on awareness programs
- energy efficiency through awareness and improved equipment purchases
- reduced travel accomplished through carpooling, teleconferencing, and distance learning
- the ESH-ID process

Paper reduction has been a priority of the Facility Manager at this FMU since its inception in 1995, building on longstanding policies established by FMU-75 precursor organizations. Paper used at FMU-75 has always been recycled. LANL conferred one of its first environmental achievement awards to a staff member of an FMU-75 precursor, for recycling and paper reduction. In the early 1980s, the NIS precursor (IT Division) promoted conversion to electronic files, in lieu of hardcopy files. This effort, too, was cited by the Laboratory, and a large cash prize awarded to the group was donated to a children's hospital in the Former Soviet Union.

General recycling through increased awareness is a subject that has been addressed in twice-weekly meetings since the formation of the facility management model.

The ESH-ID review process is applied to major purchases, work of external agencies being done at FMU-75, and FMU-75 work for others. Reviews always ask how an area will be returned to its natural site. Funds are requested up-front to achieve this restoration.

1 LEADERSHIP

1.1 ORGANIZATIONAL LEADERSHIP

The leadership system that supports environmental excellence in FMU-75 begins with the director of LANL, who in 1998, issued the Six Zeros vision for the Laboratory, which constitutes the institution's highest-level goals:

- zero injuries or illness on the job
- zero injuries or illness off the job
- **zero environmental incidents**
- zero ethics incidents
- zero people mistreatment incidents
- zero security and safeguards incidents

A comprehensive, proactive, ethics-based system cascades down from these leadership goals, which includes—as per the third bullet above—a goal to achieve environmental protection. FMU-75 interprets the “zero environmental incidents” goal broadly, to fully incorporate P2E2 core values.

The FMU Facility Manager appoints the FMU's senior leadership team. Management sustains effective leadership throughout the FMU by having a flat organization. Facility Coordinators rotate being in charge of the group, and all Facility Coordinators have the same goals and philosophy as the group leader. All Facility Coordinators take a turn as leader, and then as follower, which helps to build a feeling of trust and confidence in team members. FMU leaders maintain effective guidance by

- serving as champions or on teams: Each Facility Coordinator is assigned a major area of responsibility, and all team members work to see that the Facility Coordinator achieves the goals.
- ensuring that employee performance plans are aligned with business plan goals: This is done by written goals at the beginning of the year, which are reviewed throughout the year.
- cascading information from management meetings to employees and teams: Meetings are held twice a week. Individual meetings with team members happen daily.

The FMU Facility Manager and Facility Coordinators guide the organization by advocating uncompromising safety, by promoting P2E2 and resource conservation, and by recognizing and rewarding innovation and efficiencies in productivity.

FMU-75 has been working to establish both processes and behaviors to eliminate environmental incidents. Accordingly, we have identified the following organizational goals:

- 100% review of all projects annually to look at environmental issues
- 100% compliance with all waste regulations

Similarly, the goals focusing on safety and corporate citizenship broadly include concern and respect for the environment. To actively demonstrate managerial commitment to these goals, senior leaders have expressly stated in our evaluations that we will work to reduce waste and have 100% compliance with the laboratory waste requirements. We check garbage containers regularly to see what our customers are tossing and meet with them to come up with ideas to reduce waste. We work with customers to find alternate materials that eliminate waste, and we work with them to promote the purchase of materials with recycled content.

An integrating framework that FMU-75 and LANL overall use as an environmental management system is ISM. The broad definition of “safety” encompasses all aspects of ES&H—including P2E2 and waste minimization (see Figure 1-1). The term “integrated” is used to indicate that the safety management system is a normal and natural element of the performance of work: safety is not a workplace add-on; it is how LANL does business. ISM supports LANL's goal “to accomplish its mission cost-effectively while striving for an injury-free workplace, minimizing waste streams, and avoiding adverse impacts to the environment from its operations.” ISM implementation is a

major emphasis at LANL, and senior leaders formally review progress toward full implementation on a quarterly basis.

Each year FMU-75 leaders help NIS develop a detailed ISM Description Document that ties directly to the overall LANL ISM Description Document. This document describes FMU-75's vision, responsibilities, actions, and goals to achieve integrated safety management.

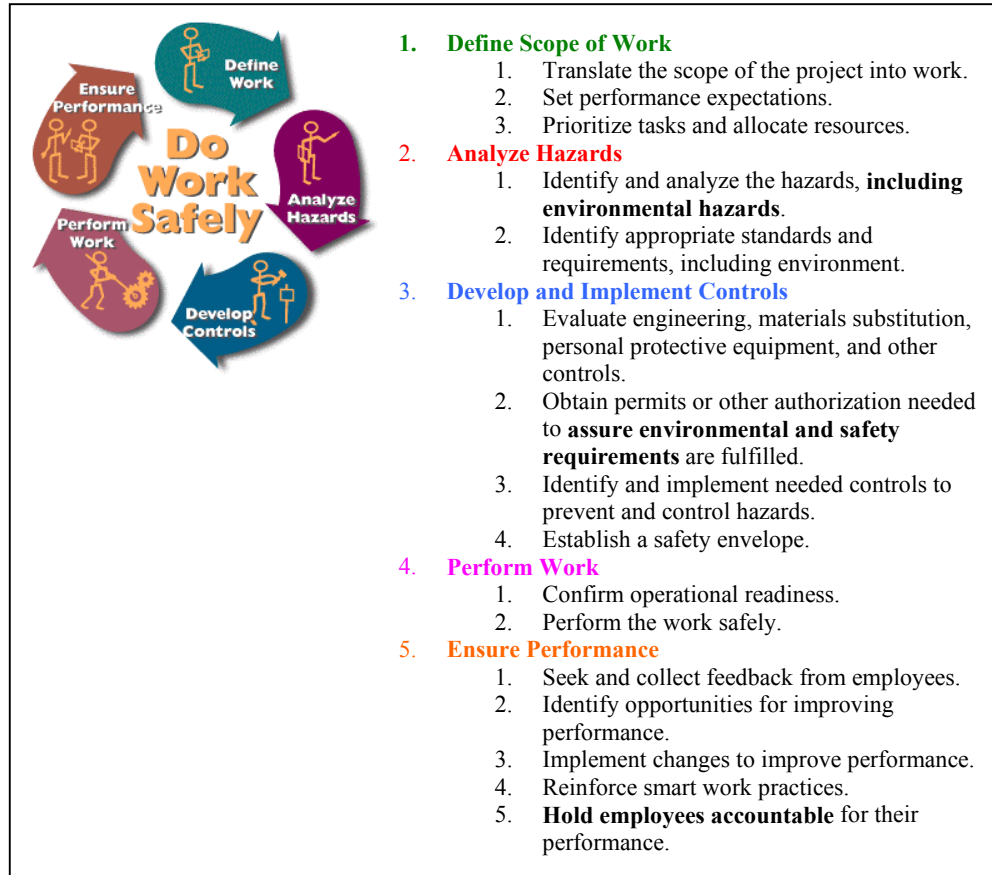


Figure 1-1. LANL's five-step process for ISM.

The ISM Project Office has established a detailed implementation schedule, available on an employee-accessible web site, and monitors all portions of LANL, including FMU-75, to ensure that milestones are achieved and that performance goals are met. ISM featured two enhancements in 2001: reference to ISO 14000 series requirements for environmental management systems and implementation of ISM Self-assessments.

Another feature of ISM is the institutional Safety Concern Program (SCP), a no-fault partnership between workers and managers to identify and resolve safety concerns. The program is designed so that managers receive electronic notification of the safety concern, and the submitter receives periodic updates as the concern is tracked to resolution and closure.

The ISM system includes Laboratory Performance Requirements (LPRs), internal requirements governing the performance of work that are drawn directly from legal or contractual regulations. LANL has grouped the LPRs into six categories, including worker health and safety and environmental protection. Laboratory Implementation Requirements (LIRs) stem directly from the LPRs and provide detailed mandatory implementing requirements for the safe and environmentally responsible performance of work. Laboratory Implementation Guidance documents provide detailed recommendations on procedures for putting LIRs into practice. See Figure 0-2.

FMU-75 has a flat organization structure, with Facility Coordinators reporting directly to the Facility Manager, especially during twice-weekly meetings. Facility Coordinators have special interest areas and work with each other to pursue those interests. The practice of rotating the Group Leader position among Facility Coordinators ensures commonality of goals and consistency in institutional culture.

These sessions focus on expectations and progress toward goals, as well as ES&H issues. For example, ergonomics is a frequent topic at these meetings, as is waste management. In addition, senior leaders review action plans for all projects, including process improvement efforts, to ensure work is being completed as scheduled and budgeted or to determine necessary adjustments to the plans.

Senior leaders also conduct regular management ISM walkarounds. These informal but structured reviews allow leaders to observe working conditions throughout their areas of responsibility, to talk informally with employees, and to note potential areas for improvement. LANL has created nine categories of guidance cards, including environmental protection, that provide suggestions on the types of observations managers should make during walkarounds. Walkaround findings in the environmental category are tracked and analyzed by means of a web-accessible database called I-Track and are reported to the most senior LANL managers by the Associate Laboratory Director for Operations. (See Items 0.1 and 6.2 for information on the roll of continuous improvement at the Laboratory.) In 2001, FMU managers performed over 40 documented walkarounds.

Other practices that demonstrate FMU management focus on environmental issues include these standing policies:

- The FMU75 Safety Team leader is responsible for environmental issues, waste management issues, and ESH-IDs (see Category 4). The ES&H Team leader can and does ask for assistance on all of these issues weekly. The ES&H Team leader is given time twice a week at meetings to address these issues.
- Waste information is shared in at least one, if not both, of the twice-weekly meetings. All facility coordinators and most other facility members are required to take training in waste management, specifically, the waste generator class, with annual updates.
- FMU-75 has a standing committee to look at use of recycled material and environmental improvement. The committee convenes during the weekly group meeting.

Information regarding organizational goals and current progress cascades to individual employees through the management structure. In addition to the twice-weekly FMU-75 meetings already mentioned, Group Leaders hold regular meetings with their staff to discuss programmatic issues.

FMU-75 is fully committed to continuous improvement of all its operations. Such improvements usually include, either directly or indirectly, a reduction of waste generation or a decrease in needed resources.

NIS Division managers allow FMU-75 to set its own goals, which we develop at strategic planning sessions (see Item 2.1). These sessions include a review of data and evaluation of past performance, including safety and environmental performance. The FMU's strategic goals, action plans, and targets derive from the needs and expectations of all key customer groups, as determined from LANL goals, Appendix F contractual performance measures, and FMU performance results.

Senior FMU-75 leaders communicate goals and action plans to employees through team, group, and all-hands meetings. In addition, the FMU-75 management team reviews goals and performance history in our twice-weekly meetings.

The planning process used by FMU-75 managers employs a line-of-sight process from high-level organizational goals to individual performance expectations. Using LANL's Performance Management System (see Item 5.1), managers then work cooperatively with employees to identify how each individual in the program is expected to contribute to the vision. This methodology has become a cornerstone for the operations within FMU-75.

LANL employees are keenly aware of transportation issues and the need for reducing travel to a minimum, both from the post-September-eleventh standpoint of security and the purely routine standpoint of long-distance commuting (fully 4800 LANL employees commute 20 miles or more to get to work). The Laboratory actively promotes carpooling by establishing reserved parking for high-occupancy vehicles in congested areas and maintaining a web page, <http://www.lanl.gov/orgs/pa/News/rideshare.html>, to facilitate contact among prospective carpoolers. Teleconferencing is similarly promoted at http://int.lanl.gov/orgs/ccn/computingatlanl/bits/97october/Delores_VTC.html. Distance education by means of teleconferencing, correspondence courses, and, especially, web-based learning is a prominent feature of training and professional development programs at LANL. Telecommuting capability for LANL employees is somewhat restricted for security reasons, but the Computing, Communications, and Networking Division Network Engineering Group makes accommodations for selected employees on an as-needed basis. FMU-75 brings in trainers to offer presentations on minimizing travel time and expense.

First aid classes are held in our main building after regularly scheduled meetings, as is CPR, waste minimization, and other occupational training.

The FMU environmental management system has posted a number of successes and sparked several P2E2 initiatives. The results of some of our successes are discussed in Category 7. Several recent initiatives demonstrating the extent to which the P2E2 ethic governs work at FMU-75 are

- **Hazardous Waste Elimination Program:** In an ongoing initiative to which we devote resources on a day-to-day basis, FMU staff investigates opportunities for hazardous-materials substitution and/or recycling. For example, mercury vapor fluorescent tubes are no longer ordered as replacement bulbs in our facilities. In 2002, we had a Ninety-day Storage Area and three satellite storage areas for hazardous waste. These areas have since been decommissioned. Our hazardous waste generation rate is now zero.
- **Orphaned Equipment Salvage:** Obsolete equipment stored at our Zebra Building warehouse might well have been earmarked for disposal because of minimal radioactive contamination. We decontaminated the equipment, found new owners for it—mainly universities.
- **Universal Recycle Storage:** We have consolidated all storage and holding of materials destined for recycle—e.g., fluorescent tubes, light fixture ballast, circuit boards, batteries, oil—in a centralized area, to facilitate handling and transport. Establishment of a centralized facility eliminates multiple pickups by waste management crews.
- **Lighting Fixture Upgrade:** Frequent power fluctuations caused unacceptable levels of light bulb failure at TA-35, Building 2, until we installed a motor control center in the basement of the facility.

Other P2E2 initiatives discussed in Criterion 7, Results, are

- Boiler Water Chemical Treatment System
- Laser Cooling System Upgrade
- Roofing Shingle Redeployment
- Roofing Gravel Recycle
- Lumber Recycle

In one of LANL's most ambitious construction projects in years, NIS is building a \$60-million, 163,000-square-foot Nonproliferation and International Security Center, with project-review oversight being exercised by the FMU-75 Facility Engineer. The third and forth floors of this structure will house a Sensitive, Compartmented-Information Facility. FMU designers have helped NIS leaders develop a configuration so that no unclassified work need be carried out in the compartmented facility. The P2E2 impact is that white paper generated by unclassified work can be recycled, a path forward that would have been unavailable had classified and unclassified work been commingled. Further, with sustainability in mind, engineers designed the cladding of the building to enhance the insulation effect of the walls through the use of panels composed of lightweight concrete with a high R-value. Lighter walls also mean that less steel is used in the superstructure. See Figure 1-2.



Figure 1-2. A crane lifts a lightweight, high-R-value cladding panel into place on the walls of the new Nonproliferation and International Security Center.

1.2 COMMUNITY LEADERSHIP

Because it is part of the larger LANL organization, FMU-75 has limited interaction with the public on environmental issues. LANL has designated the Community Relations Division to routinely handle interactions with the public. Presentations, discussions, and workshops specifically focused on environmental issues are typically coordinated through the Risk Reduction and Environmental Stewardship Division (RRES). Other community interactions take place through the many integrated outreach programs of LANL. FMU-75 is involved and/or represented in all of these institutional outreach activities.

The Northern New Mexico Citizens Advisory Board is a community advisory group that provides advice and recommendations to the Environmental Management sector of DOE about environmental restoration and waste management at LANL.

A key aspect of LANL procurement, including that of FMU-75, is to support, whenever possible, local vendors, especially small businesses and those owned by minorities and women. The BUS Division Small Business Office (SBO) has in place a number of programs that support small business and economic development in the region. Some of the programs include the Northern New Mexico Preference Program, part of Los Alamos' Regional Purchasing Program designed to strengthen regional business enterprises, stimulate greater regional employment and infrastructure, increase the business tax base in Northern New Mexico, and reduce regional dependence on the federal government. SBO this year also established the Historically Underutilized Business Program and has hosted several regional trade fairs to bring together small business owners with government and Laboratory procurement officials.

Each year, SBO establishes socioeconomic goals and northern New Mexico procurement goals. In FY01, LANL's procurements in northern New Mexico totaled \$357 million—\$11 million more than in FY00 and \$166 million more than in the DOE benchmark year of FY96. Whenever possible, FMU-75 attempts to purchase materials locally. SBO has conducted a number of workshops and training sessions for small businesses interested in doing business with the Laboratory. SBO provides guidance to these businesses regarding such matters as establishing proactive P2E2 programs and using/providing products with recycled content.

The FMU tracks its performance in regards to the purchase of environmentally friendly products and items with recycled content (see Item 4.1). Results in Item 7.1 show both LANL's and FMU-75's performance in supporting purchase of green products.

FMU-75 also contributes to LANL's highly successful environmental initiative Mail Stop A1000. This is an effort to recycle unwanted junk mail and other printed material. FMU employees re-address unwanted mail to MS A1000, and LANL mail delivery personnel collect and sort the material as part of their normal mailroom activities. In FY00, the program recycled 212 tons of material and 397 tons in FY01. This program has received wide publicity both inside and outside LANL and in 1999 received a White House Closing the Circle Award. The Closing the Circle program, now in its sixth year, recognizes federal employees and their facilities for efforts that result in significant positive impacts on the environment in waste prevention, recycling, affirmative procurement (purchasing recycled products), environmental preferability, model facility demonstrations, and promoting change.

Much of the material recycled through Laboratory P2E2 initiatives (Items 0.5, 3.1, and Criterion 7) is handled by the Nambé Recycling Facility, in partnership with LANL and LANL's support services subcontractor, Johnson Controls of Northern New Mexico (JCNNM). The Nambé Recycling Facility, based in nearby Nambé Pueblo, is a Native American-owned company that annually processes 5000 tons of concrete and asphalt, 350 tons of paper products, all types of glass, plastic types 1 and 2, and scrap metal.

All told, LANL and UC support at least 14 community outreach programs in Northern New Mexico, some implemented by the Community Involvement and Outreach Office, others by such diverse entities as Environmental Restoration Project Outreach and the Tribal Relations Team. Virtually all organizations at the Laboratory, including FMU-75, are involved in outreach to some extent, with activities ranging from highly technical to purely charitable. Notable highlights include

- 39 educational programs annually serving between 1 and 2 thousand students, from kindergarteners to Ph.Ds
- 7 charitable funds, including the LANL Foundation, which has provided more than \$3 million, especially for scholarships, since its inception in 1997
- at least 50 technical user facilities

2 PLANNING FOR CONTINUOUS ENVIRONMENTAL IMPROVEMENT

2.1 PLANNING FOR ENVIRONMENTAL IMPROVEMENT

LANL has developed and uses as a long-term, guiding blueprint, the Laboratory Strategic Plan, 1999-2004 (available at <http://www.lanl.gov/orgs/pa/News/StrategicPlan99.html>). The current LANL strategic plan sets out major programmatic objectives and strategies. It also identifies environmental objectives related to most major LANL goals. In addition, a major objective of demonstrating operational excellence in all activities specifically calls out the following strategies:

- Achieve measurable improvements in safety and environmental stewardship through full implementation of ISM [which includes P2E2] throughout LANL.
- Manage wastes and hazardous legacy materials effectively and accept the challenge of minimizing the generation of hazardous wastes in the future, with a long-term direction toward zero emissions.

Each year LANL also produces an institutional plan, a five-year perspective on LANL operations. The Institutional Plan FY 1999-FY 2004 (available at <http://lib-www.lanl.gov/la-pubs/00418669.pdf>) identifies strategic requirements for LANL organizational units, including FMU-75; summarizes strategic, tactical, and programmatic plans; and helps ensure the integration of LANL activities with DOE priorities.

Finally, a cross-functional team of Laboratory employees, experts in subject matters related to environmental performance, meet annually to identify and set priorities for the institutional environmental performance. This process, based loosely on ISO 14001 principles, includes aspect identification and the creation of draft targets and objectives for improvement efforts. This information is then transmitted to the Laboratory's Safety Function Manager for the Environment, who prepares an annual summary of environmental concerns that is transmitted to senior Laboratory management for action. The goals established by this process are then assigned to LANL organizations called Issue Teams, which develop action plans, report planning status monthly to the E in ISM Team, and track implementation progress. The significant environmental issues addressed by these teams in 2001-02 are water conservation, elimination of ozone-depleting substances, reducing RCRA hazardous chemicals, and fire prevention. Item 6.2 identifies the overall institutional process for environmental improvement.

Based on LANL strategic directions, identified high-priority environmental improvement goals, and DOE requirements, FMU-75 then develops its own strategic plan, embodied in our annually negotiated Facility Management Plan and Agreement. The Facility Management Plan and Agreement sets forth the services that we will provide to tenants and tenant responsibilities. Significant features of the plan include

- roles, responsibilities, and authorities
- conflict resolution
- environmental management work package
- waste management work package
- safety work package; safeguards and security work package
- maintenance work package; construction work package

Figure 2-1 gives an overview of the FMU-75 strategic planning process, which includes input from each of the following:

- institutional strategic goals and objectives
- past performance, as documented through such activities as ISM walkarounds (see Item 1.1), as well as results from process improvement efforts (see Item 6.2)
- other operational results (see Category 7)
- general and specific measures from Appendix F that influence FMU-75 focus (see Item 3.1)

- employee feedback gathered through LANL's annual Employee Checkpoint Survey (Items 5.3 and 7.2) and the LANL Upward Appraisal Program (Items 5.2 and 7.2)
- the FMU-75 advisory committee that provides additional data on best practices and industry standards

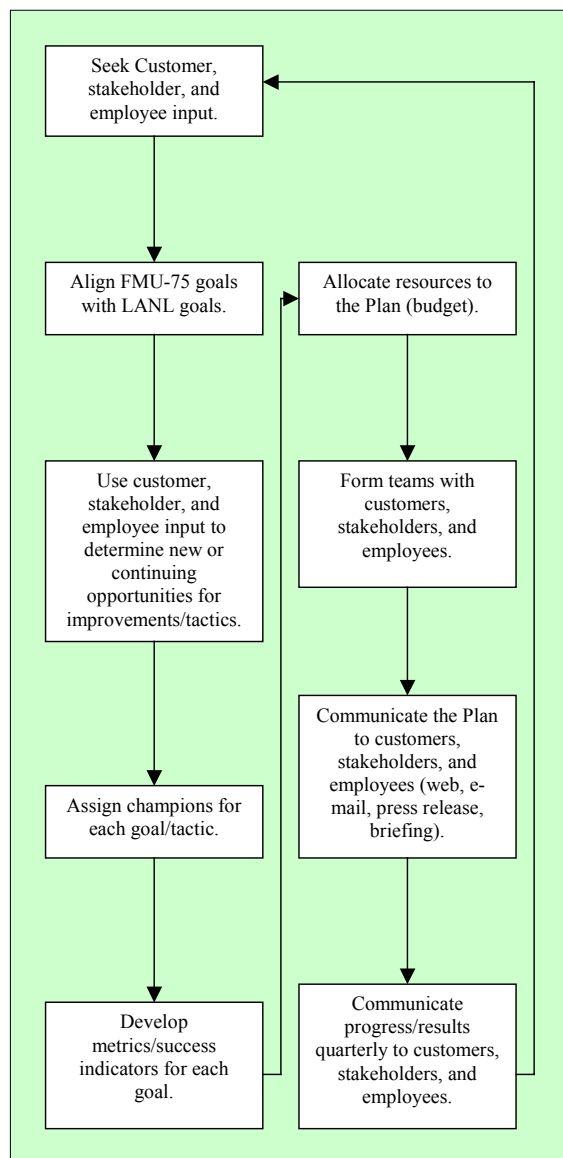


Figure 2-1. FMU-75's strategic planning process for developing the annual Facility Management Plan and Agreement.

In addition, through senior leaders' negotiations and assessments with DOE and UC stakeholders, FMU-75 managers get a clear perspective of how stakeholders view LANL performance vs. that of LLNL and LBNL in the competitive environment (to the extent our fellow national laboratories can be considered competitors).

The strategic mechanism for incorporating environmental concerns into action plans (see Item 2.2) is a provision in the Facility Management Plan and Agreement mandating reviews by means of the ESH-ID process (see Category 4).

Participation in the New Mexico Green Zia Environmental Excellence Program this year, with accompanying development of appropriate measures and performance indicators, is another key element allowing the FMU to incorporate environmental focus into long-range plans. The exercise will provide FMU-75 an annual third-party, independent evaluation of successes and opportunities for improvement in environmental performance. Strengths

and opportunities for improvement identified in the Green Zia feedback reports will be used in the ISM quarterly self-assessments (see Item 2.2).

DOE exercises high-level input into LANL strategic planning by means of the Integrated Resource Management Plan (IRMP), a strategy identified in the 1999 SWEIS to mitigate the environmental impact of operating the Laboratory. IRMP specifically addresses groundwater and watershed protection, air quality, energy consumption, waste management, and cultural-resource oversight. Full integration of IRMP and ISM is slated for October 2002.

2.2 ACTION PLANNING

After identifying goals, FMU-75 develops P2E2 initiatives, targets, and measurements of success, as shown in Figure 2-2. Because managers and employees recognize that inefficiency leads to waste, there is an ongoing effort to improve operations. Item 6.2 describes the method by which key FMU processes are analyzed and improved. These improvement efforts include short-term action plans, which at FMU-75 take the form of landlord-tenant agreements negotiated annually with each organization that occupies space at our facilities. These landlord-tenant agreements incorporate, by reference to the environmental management work package in the Facility Management Plan and Agreement, an obligation on the part of the tenant to send notice via the ESH-ID process of any change in their operations or funding that has potential environmental impacts.

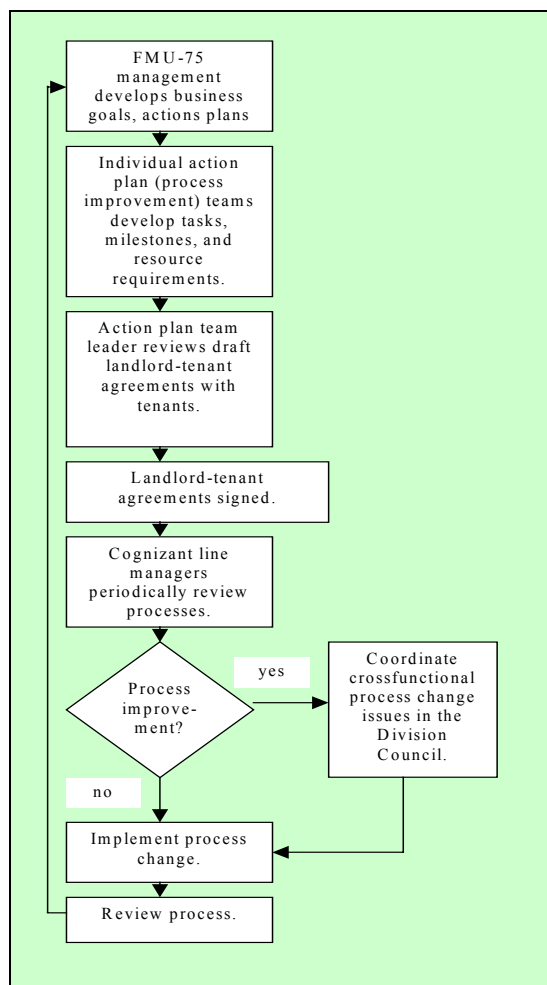


Figure 2-2. FMU-75's process for deploying and tracking action plans.

NIS's ISM quarterly self-assessment and implementation strategy for ISM focuses on how to involve all employees in making environmental improvement a routine part of all operations. In combination with the leadership systems previously described, these efforts also contribute to the development and execution of action plans.

Division-level ISM quarterly self-assessments demonstrate management ownership and accountability. To perform a credible self-assessment we identify the sources that provide relevant information. These sources include subject matter experts, plus pre-existing data sources such as occurrence reports, accident reports, and management walkaround findings. The focus of the self-assessment is on functionality, which usually requires direct observation of work. The results of self-assessments are documented and disseminated to the Performance Assurance (PA) Division Performance Indicator (PI) Group and upward to the division's Laboratory directorate. A significance category is assigned to each issue identified. To ensure that our line managers act on results, F&IB provides feedback to the division.

The Facility Manager, who is responsible for Green Zia action (see Figure 0-2), is also responsible for teaming with Facility Coordinators to assess action plans, both with a view to regulatory compliance issues and to environmental excellence beyond mere compliance. The team's recommendations are incorporated into the planning process at the points corresponding to the top three boxes identified in Figure 2-2. Submission of this Green Zia award application is part of an ongoing FMU effort to more effectively and systematically focus on environmental performance. Figure 2-3 shows how FMU-75 will incorporate the team's recommendations into action plans and how the FMU's efforts will contribute to LANL's success.

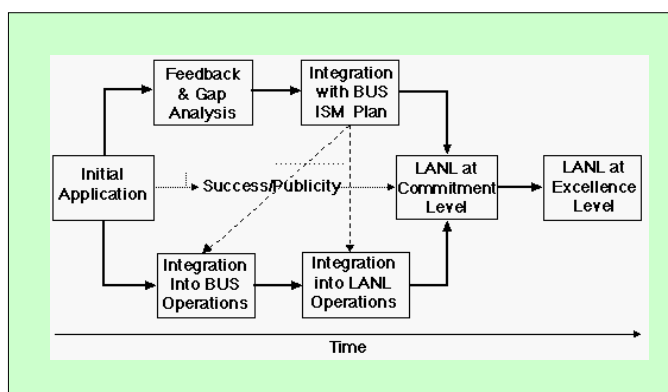


Figure 2-3. LANL's and FMU-75's Green Zia plans.

2.3 INTEGRATION AND IMPLEMENTATION

A critical high-level driver to conform short-term action plans with long-term strategic plans is DOE Acquisition Regulation 970.5204-2, Integration of Environmental, Safety and Health into Planning and Execution. Certain key provisions of this acquisition regulation affect LANL operations in fundamental ways. These provisions mandate that LANL must

- adopt seven guiding principles of safety management that is fully integrated, Laboratory-wide
- integrate environmental protection into the concept of safety
- integrate environmental issues into hazard analysis
- adhere to DOE Work Smart Standards for worker, public, and environmental protection

To the seven guiding principles mentioned above, the Laboratory has added an eighth—management commitment and employee involvement. The result is ISM (Items 0.1 and 1.1).

Appendix G of the UC-DOE operating contract is the main mechanism that integrates FMU-75 strategic P2E2 planning—and strategic P2E2 planning across NIS and in other divisions—with strategic planning Laboratory-wide.

Appendix F of the contract is the main mechanism that integrates FMU-75 performance with performance Laboratory-wide (Items 0.4, 3.1, and 6.2 and Categories 4 and 7). The negotiation steps for Appendix F measures, the process to set priorities, the improvement steps, and the resulting evaluations (see Figure 2-4) all help focus FMU-75 resources on key business practices and improve operational quality. The Appendix F process features quarterly division-level self-assessments, which are rolled up into an annual Laboratory-wide self-assessment (distinct from annual ISM Self-assessments) and evaluation by both UC and DOE. In connection with quarterly self-assessments, FMU-75 senior leaders meet with UC and DOE representatives to discuss current progress against

goals and to identify any issues. Senior leaders also interact more often with DOE and UC customers on an as-needed basis. The regular and frequent interaction helps prevent surprises, mitigate problems, and create a cooperative rather than an adversarial atmosphere.

Section C of Appendix F contains about sixty operations and administration criteria—further broken down into specific performance measures—in nine functional areas. The contractual provisions that constitute critical measures of LANSCE performance in the environmental arena are set forth in Table 2-1.

During the annual Appendix F assessment and appraisal process, examiners assign a score to a given performance measure according to a quantifiable “gradient.” The quarterly self-assessments allow managers to track resource allocations and to make any necessary adjustments to either funding or human resource allocations.

Before an action plan can be implemented, ISM calls for development of a hazard control plan (HCP) and/or an activity hazard analysis (AHA) All HCPs and AHAs must identify work hazards—which most emphatically includes environmental hazards!—and controls. Managers must sign HCPs and AHAs, and only properly trained workers are authorized by the HCPs and AHAs to do the work. HCPs and AHAs are generated for all activities, from office-type work through handling and using radioactive materials and explosives. Generally, these plans are originated by employees (those most familiar with the work to be performed and the controls required) and reviewed and approved by management. These plans constitute the authorization basis (AB) for performing the work at a given facility. (AB documents set forth a contractual agreement between DOE and UC in which DOE authorizes certain operations to be carried out at a facility on the basis of safety analysis report approvals, environmental reviews, readiness assessments, and other determinations. Also see Item 6.1.) HCPs and AHAs must include

- a description of the work, in sufficient detail to make hazards clear to the reader
- a description of controls to achieve acceptable risk
- knowledge, skills, and abilities necessary to use the controls
- wastes, or residual materials, produced and how they must be handled
- environmental impacts
- an estimate of the work’s residual risk with the control system in place
- a description of emergency actions to be taken in the event of control failure
- a change-control process for modifying the HCP or AHA and notifying affected people

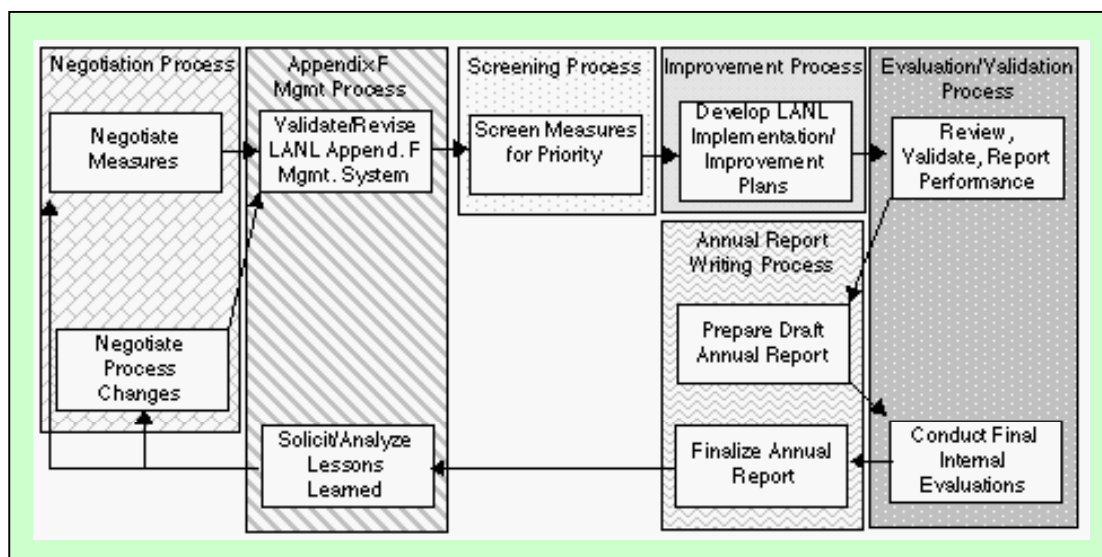


Figure 2-4. LANL Appendix F process (18-month continuous cycle).

Table 2-1: Appendix F Contractual Provisions for Operations and Administration

Functional Area	Performance Objective	Criterion	Performance Measure	Item
1 Environmental Restoration and Waste Management	1.0 Environmental Restoration	1.1 Progress in Completing Environmental Restoration Project Activities		
	2.0 Legacy Waste Management			
	3.0 Effective and Cost-efficient Waste Management Program	3.1 Specific Program Management Accomplishments	3.1.a Tracking and Cost Savings	
2 Environment, Safety, and Health	1.0 Do Work Safely	1.2 ISM System Effectiveness	1.2.a Environmental Performance	
			1.2.c Waste Minimization, Affirmative Procurement, Energy and Natural Resources Conservation, Pollution Prevention, and Transuranic Waste Minimization	1.2.c.1 Waste Minimization, Affirmative Procurement, Energy and Natural Resources Conservation, and Pollution Prevention,
3 Project/ Construction/ Facilities Management	3.0 Maintenance	3.1 Facility Sustainability		
	4.0 Utilities/ Resource Conservation	4.2 Energy and Resource Conservation		

Another powerful tool for continuous integration and improvement is the ISM ESH-ID system, discussed in Category 4. The strategic mechanism for integrating environmental concerns into action plans (see Item 2.2) is a provision in the Facility Management Plan and Agreement mandating reviews by means of the ESH-ID process.

Development of clear strategic and action plans allows for full integration of performance requirements for each individual FMU employee. As Item 5.1 explains, objectives for each employee are designed to ensure that the organizational objectives are met and that the employee has a clear view of how his or her work requirements contribute to the success of the entire organization.

3 CUSTOMER, SUPPLIER, AND OTHERS INVOLVEMENT

3.1 CUSTOMER INVOLVEMENT

Just as frequent and open communication marks FMU-75's internal management practices, so does it characterize interactions with customers and stakeholders. The FMU is highly conscious of the need to fully involve all affected parties in seeking to improve the efficiency of work and to demonstrate a sustainability ethic in daily operations. The key process for involving customers is embodied in the performance measures found in Appendix F of UC's operating contract, which accomplish this objective by providing clear expectations, promoting accountability, and improving customer relations. Hence, Appendix F serves as a major vehicle for both determining customer requirements and performance levels for all of FMU-75's customer segments. Table 3-1 shows a number of Appendix F criteria especially relevant to customer involvement.

DOE—our primary customer—drives the Laboratory toward greener practices (see Item 7.1) and, by extension, drives FMU-75, as well. For example, in keeping with the DOE goal to realize a recycling rate of 45% for sanitary solid waste by 2005, complex-wide, FMU-75 has undertaken initiatives such as those identified in Item 1.1.

All of FMU-75's customer focus approaches are based on the model shown in Figure 3-1. Using the requirements and expectations data obtained by this model, the FMU can align its business plan with customer priorities. The model also helps the FMU take action to improve customer satisfaction and close the loop with the customer.

Table 3-1. Appendix F Measures Relating to Customer Satisfaction

Operations and Administration Functional Area	Performance Measure	Focus
Financial Management	2.2.b	Effective reporting to customers
	3.1.a	Customer satisfaction
Human Resources	1.6.a	Customer feedback in workforce planning
Information Management	1.2.a	Customer focus in network services
Procurement	1.1.a	Assessing system operations
	1.2.a	Effectiveness; JIT Contracts
	1.3.a	Supplier performance
	1.4.a	Socioeconomic subcontracting
	2.1.a	Customer satisfaction rating
	3.1.a	Employee satisfaction rating
Property	5.1.a	Aligning customer expectations

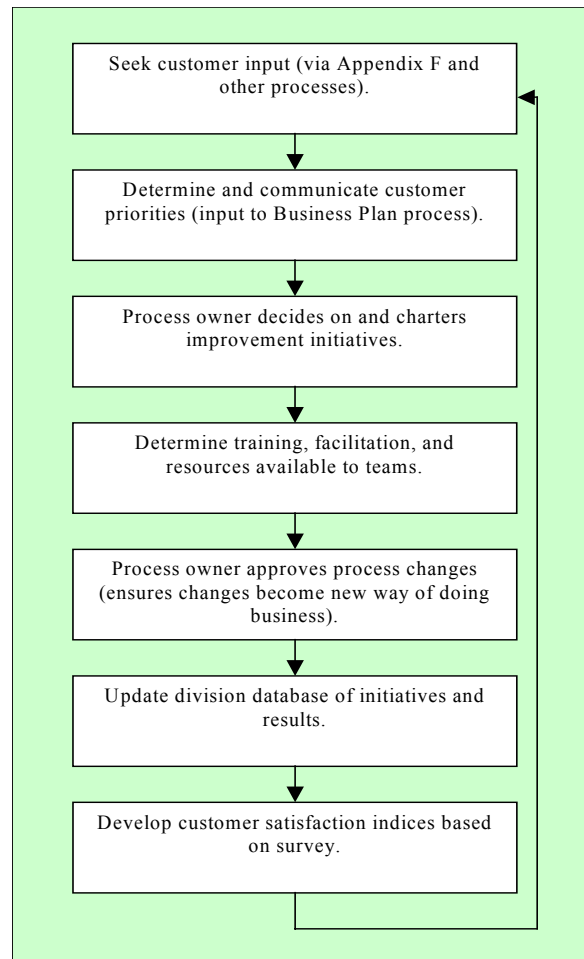


Figure 3-1. FMU-75's customer satisfaction model.

To monitor public perception, FMU-75 relies on an annual survey of public opinion, which LANL has conducted since 1998. The resulting reports profile New Mexico community leaders' awareness of and satisfaction with LANL operations. The survey also helps to identify current and emerging issues of importance to leaders in the region. In addition to asking about general perceptions of LANL, the survey allows respondents to voice their opinion of LANL's environmental responsibility. Results from the survey are recorded, analyzed, reviewed, and used in planning activities.

TA-33, one of the FMU's largest tracts of real estate, adjoins Pueblo lands on one side and Bandelier National Monument on the other. We worked with both organizations recently to help establish a wildlife sanctuary. We work with Bandelier to clean up old material left over from the war years that has spread onto Bandelier property and Pueblo property. Our Facility Coordinators escort EPA personnel to the Rio Grande and tributary streams to collect samples. We work with Native American neighbors who wish to inspect the Indian ruins and shrines on the site at TA-33.

As discussed in the organizational overview, FMU-75 is a government organization with a fixed market (LANL) and captive customers. Therefore, criteria that call for information regarding expanding markets, developing business opportunities, or potential customers are not applicable.

3.2 SUPPLIER INVOLVEMENT

Most of FMU-75's opportunities to interact with vendors on the basis of environmental concerns are limited. In addition, LANL financial policies require that most product/service purchases be coordinated through LANL's BUS Division. Specific supplier requirements are defined for each supplier in a customized contract, which is negotiated, implemented, managed, and evaluated by BUS procurement personnel. When data suggest that a change to the supplier's process be made, BUS Division provides a team to work with the supplier to improve its process using the classic plan-do-check-act—aka PDCA—process. BUS Division is also responsible for evaluating the overall performance of suppliers, as specified in Appendix F. Figure 3-2 shows the LANL contracting process, which FMU-75 follows.

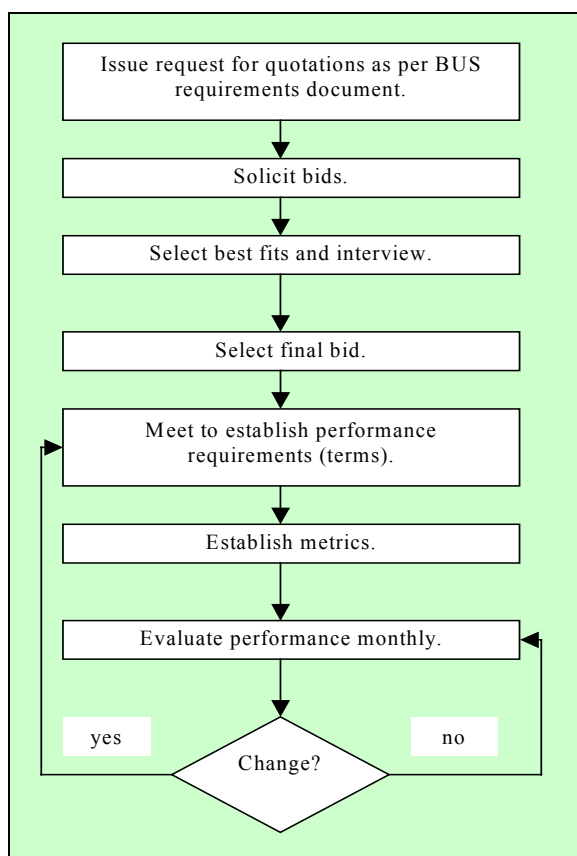


Figure 3-2. The supplier management process.

Within its limited sphere of interaction with suppliers, FMU-75 does, however, employ several environmental considerations. For example, the FMU now ensures that vendors supply only computers equipped with Energy Star, an energy saver function that turns off the monitor's screen when the computer is not in use. The FMU also is making a determined effort to ensure that purchased office products, including paper, contain recycled content. Another example of our continuing effort to work with vendors in achieving P2E2 solutions is the Roofing Shingle Redeployment project mentioned in Item 1.1. When the Cerro Grande Fire damaged the roofs of several transportables in 2000, we were faced with replacing the shingles. After much study and after working with several vendors, we found we could cover over the damaged shingles with metal Pro-Panel roofing. This would stop future fire problems and melting problems. This system also saved us from dumping several thousand pounds of old roofing material in the landfill. The old shingles covered well and added to the insulation factor of the roof, saving both energy and space in the dump. In another project, Roofing Gravel Recycle (Item 1.1), carried out in 2001, we confronted the persistent problem of standing water associated with flat roofs and consulted with vendors to identify the most environmentally friendly material—a cold process. The old roofing gravel was taken off and used to cover a roadway and a parking area.

Our parent division, NIS, garnered the 1999 Business Management Award for its “outstanding performance in the combined management of finance, procurement, and property.”

3.3 OTHERS INVOLVEMENT

FMU-75 has several partners internal to LANL that drive us in the direction of P2E2. As stated earlier, FMU-75 interacts with BUS to set up contracts and purchase requests. BUS is one of the key players in the Green Zia Environmental Excellence Program. Through its participation in the program, BUS has made several improvements to vendor contracts to incorporate green products (see Criterion 7).

Another LANL partner is the Environmental Restoration Project, which is tasked with cleaning up wastes at sites throughout the Laboratory—including sites on FMU-75 real estate—from past treatment, storage, and disposal practices. Environmental Restoration work has no direct impact on our budget, but work with other partners does. For example, Generator Set-aside Fees (GSAFs), which are levied on every unit of certain wastes we produce. GSAF funds, administered by the RRES Division Prevention Program (PP), are specifically earmarked by LANL for P2E2 initiatives. The Boiler Blowdown Waste Stream Reduction project mentioned in Item 1.1 was a \$48,000 GSAF-supported project.

One LANL partner that no longer taxes us is FWO, which previously recharged the FMU about \$2.50 per kilogram for disposal of hazardous waste. The Hazardous Waste Elimination Program mentioned in Item 1.1 has obviated such recharges.

Externally, FMU ES&H practices are regulated by EPA, NMED, OSHA, and NRC. RRES Division coordinates most direct contact with oversight agencies. FMU-75 supports RRES Division in preparing permit applications, meeting with regulatory agencies to provide technical input, and assisting RRES Division in conducting regulatory agency audits. RRES Division and NMED hold joint public meetings to provide new information. RRES Division provides funding to NMED for studies like the dose reconstruction project. DOE provides funding to NMED to staff an office in Los Alamos with oversight personnel.

LANL has a graded, systematic approach for reporting data and other activities. Routine monitoring data are reported in the annual Environmental Surveillance Report. In the event of an accidental spill, any levels exceeding regulatory reporting limits are reported through RRES Division to EPA or NMED. Each division, including NIS, develops an emergency response plan, which describes to whom and in what time frame information is reported. If an off-normal event occurs at FMU-75, we participate directly in the DOE Occurrence Reporting and Processing System investigation. A root cause is identified for each occurrence, responsibilities assigned, and remedial measures defined. These occurrence reports are available to the public and to regulatory agencies at <http://drambuie.lanl.gov/~esh7/Finals/> and in LANL's public reading rooms.

Appendix F assessments and appraisals are the primary way that LANL communicates continuous environmental improvement goals to interested parties and receives feedback. This process is subject to significant third-party audits that provide independent evaluation of success. We also consider the evaluation to be provided by the Green Zia examiners as an opportunity to receive third-party, independent assessment of our continuous environmental improvement program and its results. Reports are prepared and distributed internally for all audits. Regulatory audit results and other continuous environmental improvement project data are published in LANL's annual Environmental Surveillance Report and distributed to the public and other interested parties.

4 INFORMATION AND ANALYSIS

4.1 INFORMATION COLLECTION MANAGEMENT

The Appendix F Process is a key performance indicator of LANL contractual requirements with respect to information collection and management. See Table 4-1 for a listing of applicable Appendix F performance measures.

Table 4-1. Appendix F Measures In the Information Management Focus Area

Performance Measure	Focus
1.2.a	Customer focus in network services
1.3.a	Implementation of a records management system
1.5.a	Institutional-level management of enterprise data; customers address compliance issues; implementation of data architecture plan

Appendix F is also a primary mechanism that LANL uses to document organization-wide environmental activities, especially by means of division-level Quarterly Appendix F Self-assessments. Self-assessment input includes data on waste disposal, radiation exposures, internal laboratory audits, external audits by organizations like NMED, DOE-wide occurrence reports, internal Laboratory occurrences and lessons-learned reports, ISM walkaround findings, regulatory requirements, and DOE orders.

As stated in Item 0.4, Appendix F serves to standardize DOE green requirements among UC Laboratories. But Appendix F, as a contractual agreement, is a compliance-based driver, depending as it does in large part upon lagging indicators. In keeping with the ISM principle to move beyond mere compliance, PA-PI Group has begun implementing the Internal Performance Indicator Program. PA-PI has developed a body of leading ES&H indicators from best-in-class practices. Leading indicators tracked by PA-PI include such key yardsticks as chemical purchases, ergonomics statistics, and preventative maintenance records for radiological facilities.

Management of information on materials input, output, and waste is initially addressed in a NEPA SWEIS. In accordance with ISM Step 2, Analyze Hazards, the team identifies all potential environmental air or water releases, any solid wastes or wastewater that might be generated, any hazardous chemicals used, and other information needed to determine environmental impacts and safety concerns. Also in accordance with ISM Step 2, the team develops controls suitable for mitigating environmental and safety impacts of the hazard.

RRES Division posts this information in the form of an ESH-ID. FMU-75 participates in the ESH-ID system on a voluntary basis. ESH-ID information is accessible on the web, where it is consulted by FMU-75 and other Laboratory organizations, which provide feedback. Permits, notification, and other documentation needed are identified at this stage. The FMU ES&H team reviews the ID for P2E2 opportunities. DOE reviews the project with regard to NEPA requirements to determine whether the work is significant enough to trigger an environmental assessment or environmental impact statement, to assure that there are no significant adverse impacts and that the project is environmentally sustainable.

The ISM ESH-ID process, then, constitutes a key environmental information management system at the Laboratory.

An additional tracking mechanism relevant to ES&H practices at FMU-75 includes the Automated Chemical Inventory System: Our ES&H Team Leader uses this database to monitor the chemical inventories of our tenants. The system lists what chemicals are being brought into the FMU. The list is cross-checked with Facility Coordinators, to be sure they are aware of chemicals being used and stored and the waste stream for these items. We also check to be sure there is a current ESH-ID that addresses these chemicals and that they are addressed in the Facility Safety Plan (FSP) of the facility in question.

New processes or existing processes using new materials may require detailed examination using the NEPA screening tools or the ESH-ID process. A new HCP or AHA may be required if the process or material hazards have not already been examined and appropriate controls put in place. HCPs and AHAs are reviewed and revised at least annually. FMU-75 is currently revising all HCPs/AHAs so as to include protection of the environment as a safety concern, even at the level of office operations. Modification and maintenance of facilities always require ES&H

reviews by the Facility Coordinator. The ES&H Team Leader also serves as the NEPA Cultural and Biological Reviewer for all nonstandard work packages.

Finally, FMU-75 tracks information gathered through participation in LANL institutional programs. For example, senior leaders review results from LANL's public opinion survey and also analyze FMU-specific information from the annual Employee Checkpoint Survey (Items 5.3 and 7.2) and Upward Appraisal (Items 5.2 and 7.2).

The NIS Division Office in part supports the hiring of a specialist from the RRES Hazardous and Solid Waste Group, who helps the FMU and its tenants with waste issues.

Life-cycle analysis affects all facets of planning at LANL. Specific LIRs and LPRs that address life-cycle planning include the LANL Comprehensive Site Planning Program, Construction Project Management Program, Project Management for the Acquisition of Capital Assets, Managing Facility Assets, Facility Configuration Management, and Managing Radioactive Waste. These documents require that projects analyze energy, waste disposal and reduction, environmental impacts from construction, and eventual facility decontamination and decommissioning life-cycle impacts.

Because LANL is not a production facility, true cost is not a factor that is tracked. Rather, Appendix F is used to determine whether the customer is satisfied with productivity, the cost, and the product.

PP tracks NIS's (and all Laboratory division's) level of green procurement and a wide range of waste-generation metrics that include sanitary, hazardous, low-level, mixed low-level, and transuranic waste. PP presents these statistics to NIS in quarterly reports at group leader meetings.

4.2 ANALYSIS AND DECISION-MAKING

Legally, the FMU is required to comply with all regulations and DOE orders. Prioritizing opportunities for improvement, then, is informed, first and foremost, by the findings of such audits (internal or external). Audit findings that are not disputed must be addressed by the responsible party.

Planning tools take many forms in the Laboratory and FMU-75, including the Appendix F measures, HCPs/AHAs, FSPs, and AB documents, and all of these tools are brought to bear in the effort to improve products and services. The NEPA screening process, including ESH-IDs (Item 4.1), is not only a powerful information collection and management system but an effective planning tool as well, especially for identifying and pursuing opportunities for P2E2, cost savings, and risk reduction.

To the extent that Appendix F reporting compares environmental and safety performance against specific prevention-based environmental performance goals across the entire DOE complex, LANL uses this mechanism to gage its achievements against its fellow laboratories—our primary competitors for DOE funding. The various measures of LANL and FMU-75 performance are described in Categories 5 and 7. Item 2.3 describes how the comparative information is integrated into strategic planning, as well as action planning, to improve the environmental performance of specific projects/products. The ways that the Appendix F requirements for green trends are incorporated into project/product design have already been described throughout previous chapters of this application. Item 2.1 describes how Appendix F measures are used to set strategic direction for environmental improvement.

5 EMPLOYEE INVOLVEMENT

5.1 EMPLOYEE EDUCATION AND SKILL DEVELOPMENT

Overall, employee-management relations at LANL are governed by the Performance Management System, launched by Human Resources Division (HR) in 1998 (see Figure 5-1). The system requires all groups in NIS to establish objectives that support the organizational echelons above them. Objectives for each employee are then designed to ensure that the organizational objectives are met and that the employee has a clear view of how his or her work requirements contribute to the success of the entire organization. The Performance Management System ensures clear two-way communication during the goal-setting phase of the process and provides a focus for ongoing discussion about work objectives and processes.

Specific goals include

- aligning individual expected results with institutional goals
- identifying and assessing individual performance
- linking performance to rewards or consequences
- designing development plans to support improving performance in current jobs and/or increasing impact on the organization
- enhancing employee/manager ownership of individual and organizational performance
- improving two-way communication between supervisors and employees

A concomitant to the Performance Management System is LIR 300-00-04, Laboratory Training: A Graded and Systematic Approach to a Qualified Workforce. Employees fill out a questionnaire regarding the types of work they do. General training needs are identified by how these questions are answered (e.g., workers who use chemicals are required to take specific chemical safety and waste generator training). FMU managers work with each employee to cooperatively prepare individual development programs—both short-term and long-term—on an annual basis. It is the manager's responsibility to supply the resources (time, money, and support) to enable the employee to accomplish his or her development plan.

Once developmental goals have been established, employees may participate in appropriate training offered by LANL or other organizations. LANL's Health, Safety, and Radiation Protection Division offers over forty courses related to environmental issues, from general safety training and first aid to courses on such specific topics as packaging and transporting hazardous materials (see Figure 5-2).

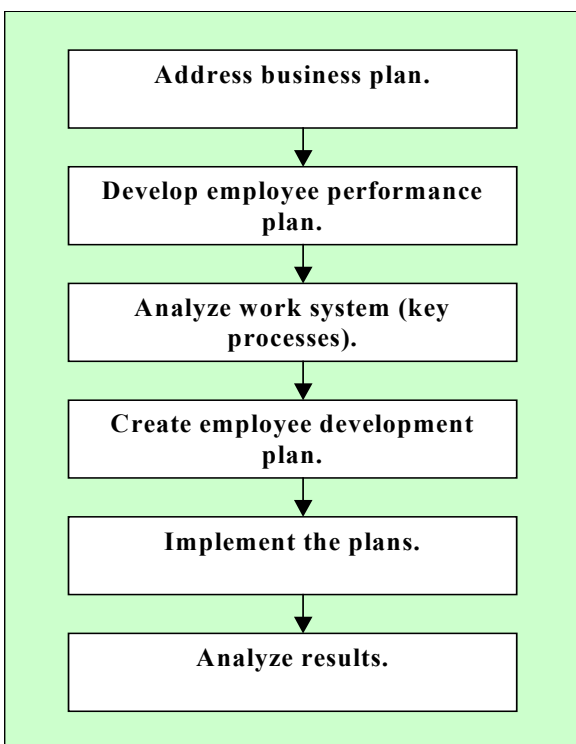


Figure 5-1. LANL's Performance Management System.



Figure 5-2. The Health, Safety, and Radiation Protection Division environmental training home page.

LANL training is assessed by audits, as is that of FMU-75. Also, each worker receiving training evaluates the course. Health, Safety, and Radiation Protection Division modifies training in accordance with audit results and

worker evaluations. In addition, they develop training for new regulatory requirements and receive feedback from the support and operating groups on the content of the training.

To keep FMU employees abreast of salient environmental compliance issues, we hold periodic briefings conducted by the FMU ES&H Team.

All employees are trained on the five-step ISM process, and their supervisors are trained in the development of HCPs/AHAs. The workers and supervisors together prepare HCPs/AHAs. The worker's supervisor assesses the worker's job skills and training. If these are adequate, the worker is authorized to work under the HCP or AHA, as applicable.

A key step in both the ISM and HCP/AHA development processes is hazard identification and control, which includes environmental and energy hazards. Personnel who use chemicals or generate waste receive specific training that covers all aspects of P2, from substitution to recycling. The training reinforces the five-step process, which encourages creative thinking and novel approaches. This quality process has a feedback mechanism as the final step so that improvements recycle back into the system. New approaches and ideas are examined for compliance, safety, enhancing the existing process, and resource sensitivity. If these are met, the process can be modified and the new approaches implemented.

Continuous reinforcement of P2E2 practices, depending as it does on input from both managers and employees, promotes the environmental ethic throughout FMU-75, beyond mere compliance with regulations. LANL's highest-level goals (see the Six Zeros, Item 1.1) encourages employees, as good citizens, to promote the environmental ethic in their communities. One key process by which FMU employees actively address community issues is through coordinated volunteer efforts, ranging from tutoring to foster care, with all-hands e-mail notifications requesting support sent out frequently and volunteer fairs organized annually. Many volunteer activities focus on environmental concerns:

- In 2000, the Community Involvement and Outreach Office coordinated employee efforts in community clean-up day in three surrounding cities—Los Alamos, Espanola, and Santa Fe.
- Following the Cerro Grande fire in May 2000, between 200 and 300 LANL volunteers (including many from FMU-75) donated weekends to help with recovery efforts.
- In April 2001, LANL volunteers donated time to help the US Forest Service plant 12,000 seedlings as part of ongoing efforts to recover from the Cerro Grande fire.

5.2 EMPLOYEE INVOLVEMENT

As stated in Item 2.3, of the eight guiding principles that inform ISM, seven are mandated by DOE Acquisition Requirement 970.5204-2, and the eighth—a commitment to employee involvement—was adopted on the Laboratory's own initiative.

To facilitate communications, all FMU managers observe an open-door policy. Employees may also provide comments and observations at group meetings. FMU-75 employees keep abreast of our home division's successes and failures in the P2E2 arena by consulting a web site on which scores posted during the current round of Quarterly Appendix F Self-assessments are published.

FMU employees take advantage of institutional mechanisms to minimize waste. For example, when employees have supplies, equipment, and materials that are no longer needed, the property administrator assigned to FMU-75 can ensure that it is re-used. Employees can also advertise unused equipment on the LANL electronic Swap Shop, where excess property is made available to the rest of LANL.

Employees may discuss any P2E2 issue with the FMU-75 Facility Manager, the ES&H Team, and waste coordinators. PP has also established an electronic mechanism for soliciting employee input on P2E2. Employees can send comments, observations, or questions to wastenot@lanl.gov. The message is routed to the environmental specialist best able to respond, the sender will be notified of any proposed action, and PP will track the issue to resolution. The SCP (Item 1.1) serves a similar function with respect to safety issues.

Laboratory-wide, employee involvement in key P2E2 processes is an essential LANL business practice. For information on the roll of HCPs/AHAs in planning, see Item 2.3; for information on the roll of NEPA screening in planning and information management, see Category 4. For information on employee's input into HCP/AHA

development, see Items 2.3 and 5.1; for information on employee input into NEPA screening, including ESH-IDs, see Category 4.

Laboratory policy on employee involvement in travel issues has been discussed in Item 1.2.

The annual Employee Checkpoint Survey (Items 5.3 and 7.2) and the Upward Appraisal Program provide mechanisms for employees to give anonymous input. The Upward Appraisal Program, in particular, sets specific expectations for managers to review feedback with subordinates and to develop action plans for improvement. Figure 5-3 shows the overall Upward Appraisal process. For more information on Upward Appraisals, see Item 7.2.

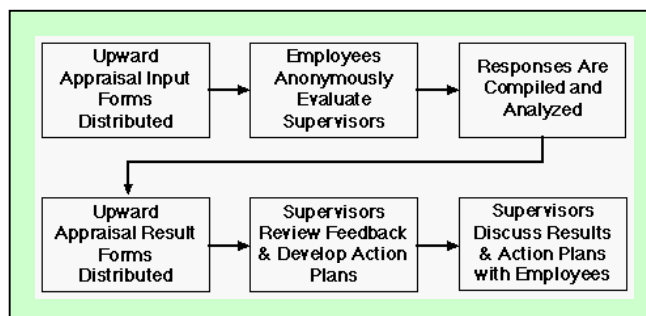


Figure 5-3. LANL's Upward Appraisal process.

Community involvement among employees has been discussed in Items 1.2 and 5.1. In some instances, outreach activities are part of FMU-75 employees' regular duties.

Additional mechanisms to facilitate employee-to-employee and employee-to-management feedback include

- nested safety committees
- monthly meetings with the ES&H Team and with the Safety Team, and a third meeting with both teams, jointly
- representation with LANL Grassroots Safety Volunteers by the ES&H Team Leader
- representation on the LANL E in ISM Team by the ES&H Team leader

5.3 EMPLOYEE SATISFACTION, VALUE, AND WELL-BEING

A key LANL business practice requires that employee interests be taken into account when planning activities, the workplaces in which they will be conducted, the risks they incur, and P2E2 issues. For information on the roll of HCPs/AHAs in planning, see Item 2.3; for information on the roll of NEPA screening in planning and information management, see Category 4. For information on employee's input into HCP/AHA development, see Items 2.3 and 5.1; for information on employee input into NEPA screening, including ESH-IDs, see Category 4.

FMU-75's major formal method for determining UC employee attitudes prevailing in the workplace—including attitudes on ES&H issues—is the annual LANL Employee Checkpoint Survey, conducted by the HR Division Training and Development Group. The survey has been conducted every year since 1994, except for 2000, because of the Cerro Grande fire emergency. Group leaders receive results from the survey specific to their groups. Managers are encouraged to share the results of the survey with employees. In 2001, HR distributed 7300 forms, 47% of which were returned. The survey contained 48 questions about career development, communication, diversity, job satisfaction, management, pay, productivity, performance management, safety and security. LANL results on the 2001 survey are cited in Item 7.2. A few Laboratory-wide highlights include

- 89% of respondents said their group management assures a safe work environment and use of safe work practices; 74 % feel safe reporting potential security incidents that they are directly involved in.
- 81% are proud to be associated with the Laboratory; 77% said their work gives them a sense of personal accomplishment.

- 62% said group management communicates decisions to employees, but only 41% said their division management communicates decisions to employees, and only 26% said that division management seeks their opinion on important issues impacting their jobs.
- 59% said there is an ongoing interest in their professional development in their group.
- 44% said the goals by which their performance is evaluated are specific and measurable, down from 60% in 1999.

There are institutional incentives encouraging staff to work smarter and utilize innovative approaches to accomplish their work. The Pollution Prevention Awards Program, sponsored by PP, is open to all LANL employees and subcontractors. It is designed to encourage individuals and teams to develop plans, programs, or ideas for minimizing waste; conserving water, electricity or natural gas; reducing air or water pollution; or procuring products with recycled content. Recipients receive recognition and a cash award ranging up to \$125 from specially allocated congressional funds. Recent winners include

- LANSCE Division for Reuse and Recycling of Gamma Ray Detector Housings
- DX Division for Oil Recycling Staging Area
- FMU-75 for Sanitary Waste Stream Reduction at TA-35
- FMU-75 for Early Adoption of Energy-efficient Light Bulbs
- FMU-75 for Orphaned Equipment Salvage to Benefit Universities

Our team members have won at least one LANL Pollution Prevention award for all but one year out of the last five.

The Los Alamos Awards Program recognizes, by means of cash awards ranging up to \$2000, achievements among UC employees not only in purely scientific and technical fields but also for notable accomplishments in the ES&H arena and for significant contributions to enhancing the quality of work life at the Laboratory. In 2001, the Los Alamos Awards Program cited

- an ecologist with Health, Safety, and Radiation Protection Division for tracking the status of commitments to NEPA
- an ecologist with Health, Safety, and Radiation Protection Division for work with regional organic farmers in determining the effect of the Cerro Grande fire on their commercial produce
- a team from Engineering Sciences and Applications Division for hosting a summer educational program for promising engineering students

To provide emotional support, LANL provides an Employee Assistance Program whose main goal is to assist employees with personal problems that are affecting their job performance. The program offers a wide variety of presentations and workshops on such topics as stress management, gender issues, conflict resolution, and smoking cessation. The program also makes available a collection of books, videos, and audio tapes on workplace issues. All services are free of charge. Usually employees refer themselves; however, a supervisor can refer an employee if job performance has been identified as a problem.

As part of the larger LANL community, FMU-75 relies primarily on institutional programs to enhance employee support. LANL offers a comprehensive set of support initiatives along with feedback systems. FMU employees are encouraged to use all LANL services that are appropriate and relevant to their individual needs, including

- the LANL Wellness Center, to provide comprehensive fitness and life-style services
- alternative workweek schedules, to accommodate diverse personal needs
- formal and informal grievance procedures, to address discrimination, harassment, and interpersonal-skills issues
- an Ombuds Office and Mediation Center, to provide structured approaches in conflict resolution

6 PROCESS MANAGEMENT

6.1 PROCESS CHARACTERIZATION AND CONTROL

Both DOE and UC stakeholders are active participants in establishing performance expectations and in appraising operational achievement through the Appendix F metrics and approval of AB documents. FMU-75 has a contractual mandate to continuously monitor and analyze its processes for potential improvements.

As discussed in Category 2, FMU-75 uses the five-step ISM process in strategic and action planning to identify environmental issues. These issues, and their resolution, become part of daily operations through the HCP/AHA process, which govern work at FMU-75 and the Laboratory. FMU-75 managers use the wide variety of data, including data from customers, employees, and operational reviews, to assess the performance of key processes. Representatives of funding organizations are involved in process evaluations through their input into the quality and usability of the final product or service. All partners in the project provide operational evaluations through the development and revision of HCPs/AHAs. See Item 2.3 for more information on risk-management practices incorporated into HCPs/AHAs, including those governing environmental risk.

Partners also provide operational evaluations through the ISM facility work control (FWC) and safe work practices (SWP) process (see Figure 6-1). The FMU-75 FWC process is designed to implement LIR 230-03-01, Facility Management Work Control. This process is designed to

- involve the personnel at the location where the work is to be done (Steps 2, 3, 7, 12)
- ensure that ES&H concerns are addressed (Steps 4, 6, 11)
- provide quality assurance checks that the work is done properly (Steps 5, 8, 9, 14, 15)
- provide feedback to improve the process (Steps 14 and 15, feeding into Step 1)

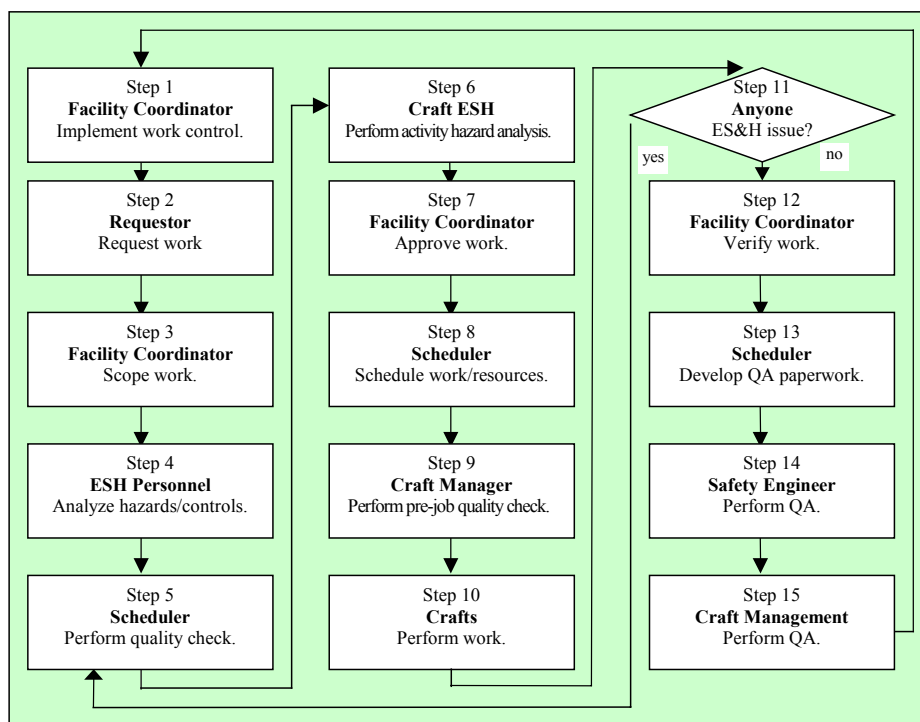


Figure 6-1. The FMU-75 facility work control process.

The HCP/AHA and FWC/SWP processes, then, function reciprocally to enhance the efficiency of ISM. When subject to process analysis by means of Appendix F metrics, the success or failure of the HCP/AHA and FWC/SWP processes in managing environmental hazards is readily evaluated. The points in the systems where successes and failures occurred can be identified. The process analysis mechanism is itself subject to scrutiny—most especially through exercises such as Green Zia award applications.

6.2 PROCESS IMPROVEMENT

As Item 6.1 explains, FMU-75 has a contractual mandate to continuously monitor and analyze processes for potential improvements. The use of Appendix F metrics by our primary customer, DOE (Items 0.1, 0.4, 2.3, and 3.1 and Categories 4 and 7) for process analysis and continuous improvement is a mature, eight-year-old system that has yielded significant upgrades in the way LANL does business. Item 2.3 describes how action planning and strategic planning integrate Appendix F metrics with ISM (especially by means of HCPs/AHAs and ESH-IDs to prioritize areas for continuous improvement, both Laboratory-wide and in FMU-75 operations, as well. Item 6.1 describes how Appendix F metrics are brought to bear on the ISM FWC/SWP system, with a view to continuous environmental improvement. Our suppliers, too, are folded into process improvement; Item 3.2 describes how BUS Division procedures function continuously to align LANL procurement policy with evolving P2E2 standards.

The ISM mechanism requires each division, including NIS, to assess its ES&H performance. ISM Self-assessment findings are institutionally reviewed by the high-level-management LANL FIB, which sets Laboratory-wide improvement priorities and targets and annually develops an Appendix F Self-assessment Plan. At the division level, management becomes responsible for providing necessary resources to meet improvement the Board's targets and for monitoring progress. Figure 6-2 summarizes this process.

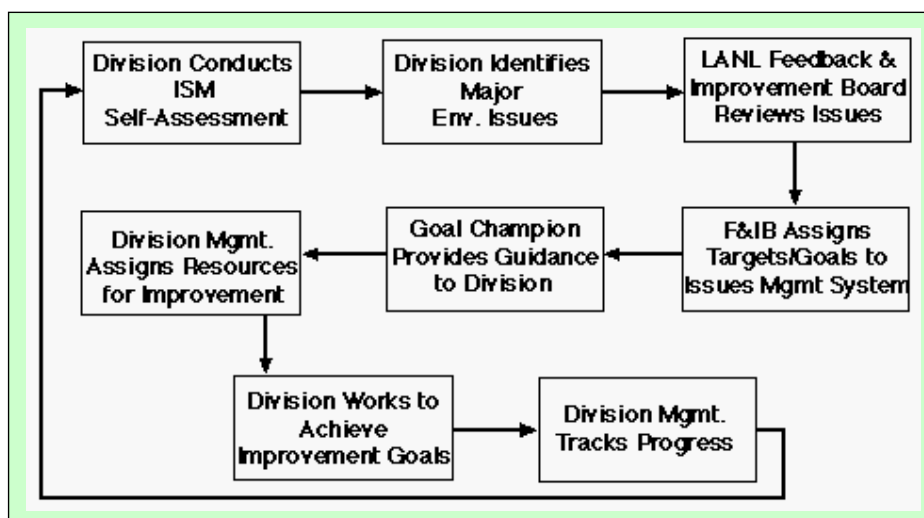


Figure 6-2. The NIS improvement process based on Annual ISM Self-assessments.

NIS establishes its P2E2 priorities division-wide by implementing reviewing F&IB guidelines, Quarterly Appendix F Self-assessments, Annual ISM Self-assessments, walkaround feedback, and conducting monthly surveillance of all waste disposal areas. We also perform an ESH-ID review of all projects and/or apply our knowledge of waste minimization practices to all projects.

Once priorities are established, action plans are developed in accordance with the principles outlined in Category 2 such that environmental improvement is integrated into daily operations, as described in Item 6.1.

While the F&IB keeps NIS informed of corporate expectations for improvement, we consider their guidelines as minimum standards that we strive to exceed. For example, during the brief history of FMU-75, we have managed to substitute nonhazardous chemicals for hazardous ones and have now completely eliminated our hazardous waste stream. We have been using environmentally-friendly mercury-free light bulbs since 1999. We are now poised to eliminate Universal Storage Areas.

LANL management well understands that benchmarking against counterparts such as LLNL is a potentially productive exercise if we are to achieve environmental excellence in our class. The mechanism for benchmarking is Appendix F (see Item 0.4). While NIS management has not yet fully incorporated formal benchmarking into the next round of strategic planning, certain P2E2 Appendix F metrics are amenable to a lab-to-lab comparison (see Category 7).

Results from improvement efforts and compliance success are communicated to senior leaders at management sessions and as part of the Quarterly Appendix F Self- assessments. Appendix F assessments permit benchmarking

against other UC-managed Laboratories. Employees learn about process improvements at the all-hands meetings and through information published electronically or as memos.

Recognizing that the continuous drive to improve our performance at FMU-75 will achieve little unless we assure organizational learning, we manage information in ways that reinforce the P2E2 ethic. Information on our successes, including awards (see Item 5.3), is communicated to FMU personnel at all-hands meetings. Successes are publicized throughout the Laboratory, mainly by articles in the online daily NewsBulletin (<http://www.lanl.gov/newsbulletin>). Additional mechanisms for reinforcing the concept of continuous improvement include the LANL Lessons Learned Program.

DOE learns of results through formal institutional lines of communication, and other stakeholders (vendors, the community) are informed through BUS contacts or by means of public affairs initiatives. Annual publications also provide stakeholders with yearly updates on environmental performance. *For the Seventh Generation: Environment, Safety, and Health at Los Alamos National Laboratory* is an annual report prepared especially for residents of communities surrounding LANL. The *Site-Wide Environmental Impact Statement Yearbook* is another publication that evaluates LANL environmental performance and tracks progress toward established goals.

FMU-75 is quick to acknowledge failure, when appropriate. Management adopts a no-fault approach to communicating information about our P2E2 shortcomings, which we characterize as “opportunities for improvement.”

Like our process analysis system (Item 6.1), our process improvement systems are themselves subject to scrutiny. In this connection, see especially Figure 6-1, Steps 14 and 15.

As stated above, FMU-75 has a contractual mandate to continuously monitor and analyze our systems for potential P2E2 improvements. Further, we have a strong financial incentive to do so. The cost of permitting, handling, and disposing of waste is a significant fraction of our operating cost. All told, a solid track record of P2E2 achievement implies that our process improvement systems are producing the desired outcome, as evidenced by the results (detailed in Category 7) that we have posted in

- materials reduction
- water conservation
- energy conservation
- waste recycling

7 RESULTS

Throughout this chapter, we reference various provisions of the DOE-UC contracts governing LANL, LLNL, and LBNL operations. All provisions referenced are contained within Appendix F of the contracts, Section C, Operations and Administration. The performance objectives, criteria, and measures (POCMs) mandated by Appendix F are our best tool for gaging the level of satisfaction with which our main customer, DOE, regards our work. The scores DOE awards on given POCMs apply to the institution as a whole. In Category 7, we present institution-wide Appendix F results in cases where FMU-75 substantively contributes to the Laboratory’s performance or in cases where an organization with which FMU-75 directly partners is primarily responsible for the Laboratory’s performance (e.g., BUS Division is primarily responsible for the Laboratory’s performance in the area of supplier management).

Appendix F scores are expressed as a percentage, with corresponding ratings assigned as follows:

<=59%	unsatisfactory
60-69%	marginal
70-79%	good
80-89%	excellent
90-100%	outstanding

Each UC-managed laboratory renegotiates its contract each year. There is no necessary laboratory-to-laboratory consistency in contract provisions, nor is there any necessary year-to-year consistency. On the whole, however, we can identify a counterpart for most POCMs, laboratory to laboratory and year to year, thereby affording useful benchmarks over time. A complicating factor to bear in mind when comparing laboratory-to-laboratory performance

is that, while we report DOE scores for LANL, we are obliged to report UC self-assessment scores for LLNL and LBNL, which may skew these institutions' scores slightly upward, relative to LANL.

Also in this chapter we present FMU-75-specific results. See Items 7.1 and 7.3.

7.1 ENVIRONMENTAL RESULTS

One of the most important Appendix F provisions relating to environmental excellence is 2-1.2.c.1, Waste Minimization, Affirmative Procurement, Energy and Natural Resources Conservation, and Pollution Prevention. This provision keys to DOE Directive "DOE 2005 Pollution Prevention, Energy Efficiency Leadership Goals," 11/12/99, and assesses three indexes:

- P2 performance
- successful pilots of P2 best practices on a Laboratory-wide basis
- implementation of P2 opportunity assessments using the New Mexico Green Zia tools

The P2 performance index is itself broken down into nine parameters. Data on six of the most critical are presented below.

LANL POCM 2-1.2.c.1 is not directly comparable to any LLNL or LBNL POCM. LLNL 2-1.2.f, Waste Reduction and Recycling, and LBNL 2-1.2.h, Waste Reduction and Recycling, constitute a much more restricted measure of P2 performance, addressing waste reduction and recycling, only. We show these restricted measures as benchmarks against which to assess LANL performance in Table 7-1. To the extent that laboratory-to-laboratory comparison of these POCMs is meaningful, we note that overall, LANL scores have lagged behind those of LLNL and LLNB. Nevertheless, there is a distinct uptick in the LANL score from FY00 to FY01, while those of our sister institutions show a flat or downward trend.

Appendix F provision 3-4.2, Energy and Resource Conservation, also has significant environmental implications. This POCM addresses the extent to which energy and resource conservation initiatives are managed in accordance with a comprehensive program management plan, a plan that sets forth a schedule of goals and tracks progress. It is very roughly comparable to LLNL 3-5.3, Energy Management, and to LBNL 3-5.3, Energy Management. See Table 7-2.

Table 7-1. Appendix F P2 Scores for Three Institutions

	LANL	LLNL	LBNL
FY99	80%	Not scored	95%
FY00	80%	92%	92%
FY01	85%	85%	92%

Table 7-2. Appendix F E2 Scores for Three Institutions

	LANL	LLNL	LBNL
FY99	88	98	98
FY00	95	98	98
FY01	85	95	Not scored

FMU-75 has posted notable environmental results for five projects carried out at the group level. These include

- **Boiler Water Chemical Treatment System:** Wastewater blowdown from boilers at TA-35, Building 2, constituted a 100-gal./day waste stream until we implemented a \$48,000 project in FY02 to replace two aging boilers with efficient modern units that use less water, and we implemented a state-of-the-art blowdown chemical treatment system that is 80% efficient and reduces the waste stream to 10-20 gal./day.
- **Laser Cooling System Upgrade:** Chillers for lasers at TA-35, Building 2, requiring ozone-depleting substances were replaced with environmentally friendly chiller systems exploiting modern technology. Not only have the new chillers eliminated concerns over ozone-depleting substances but they have also eliminated a 1800-gal./day effluent stream by means of a closed-loop system.
- **Roofing Shingle Redeployment:** During refurbishment of transportables, we worked with a contractor to adapt existing, fire-damaged shingles for use as insulation under a new roof, thereby avoiding disposal of 12 tons of material. See Figure 7-1.

- **Roofing Gravel Recycle:** We used approximately 40 tons of gravel removed from a tar roof to pave a parking lot and road. See Figure 7-2.
- **Lumber Recycle:** Summer students working at FMU-75 planned and implemented a project to use lumber from salvaged trailers to build a deck at reduced cost. This project was modest in scope but was nevertheless an effective vehicle for imparting the P2E2 ethic to students. See Figure 7-3.



Figure 7-1. The new roof on this transportable covers preexisting, fire-damaged shingles that now serve as insulation. Redeployment of the shingles avoided disposing of 12 tons of material.



Figure 7-2. The 40 tons of gravel used to pave this road and a parking lot were recycled when gravel-capped roofs were upgraded by FMU-75.



Figure 7-3. Summer students built this deck from salvaged lumber, saving FMU-75 a modest \$1500 in materials costs and gaining invaluable experience in P2 practices.

As FMU-75's mission and facilities are unique, it is not always meaningful to identify competitors against which we can benchmark our environmental and worker health and safety performance. We find it useful to compare our group-level performance with LANL as a whole.

A serviceable tool for comparing FMU-75's performance to that of LANL as a whole is the Quarterly Appendix F Self-assessment, which tracks current levels and trends in ISM's impact on our environmental performance. Consistent with a Laboratory-wide standard for reporting, we post a RCRA self-assessment index based on inspections vs. findings—with findings broken down into twelve key environmental performance parameters, such as waste determinations, labeling, and exceedance limits. The lower the index, the better the performance. Upper-level management monitors quarterly division- and group-level self-assessment indexes from across the Laboratory, as an indicator of the institution's likely performance on the annual DOE Appendix F Assessment. Early warning of a organization's failure to meet expectations automatically triggers a Management Action.

The LANL RCRA self-assessment index for all of FY01 was 0.07; for the first quarter of FY02, it was 0.03. Indexes that roll up results for all FMU-75 tenant organizations during the corresponding periods were 0.125 and 0.0, respectively.

Six critical parameters of the nine addressed in the P2 performance index, POCM 2-1.2.c.1, are hazardous waste generation, low-level waste generation, mixed low-level waste generation, solid sanitary waste generation, solid sanitary waste recycling, and affirmative procurement (AP). All parameters are associated with specific DOE goals for the Laboratory, as prescribed in DOE Directive "DOE 2005 Pollution Prevention, Energy Efficiency Leadership Goals."

Trends in waste generation indicate that LANL is on track to meet or exceed DOE's goals. In three waste categories—hazardous, low-level, mixed low-level—FMU-75 generation rates are currently zero. FMU-75 achieved zero hazardous waste generation in 2002, with the final elimination of mercury-vapor lamps, oil-based paints, and non-recyclable equipment at our facilities. Low-level waste and mixed low-level waste have never been an issue at FMU-75. By way of comparison, we present information on LANL-wide generation levels and DOE's LANL-wide goals for 2005. See Figure 7-4, Figure 7-5, and Figure 7-6.

While data for solid sanitary waste generation are available for the Laboratory as a whole, they are not available at the group level. However, FWO has deployed a new fleet of PackMaster collection trucks equipped with scales, which in the future will allow the Laboratory to track waste generation by facility management unit. We expect to present FMU-75-specific data in next year's Green Zia application. Our estimates of current vs. historic levels of

solid waste generation at FMU-75 suggest that we have reduced this waste stream by about 70% since 1997. Laboratory-wide data are presented in Figure 7-7.

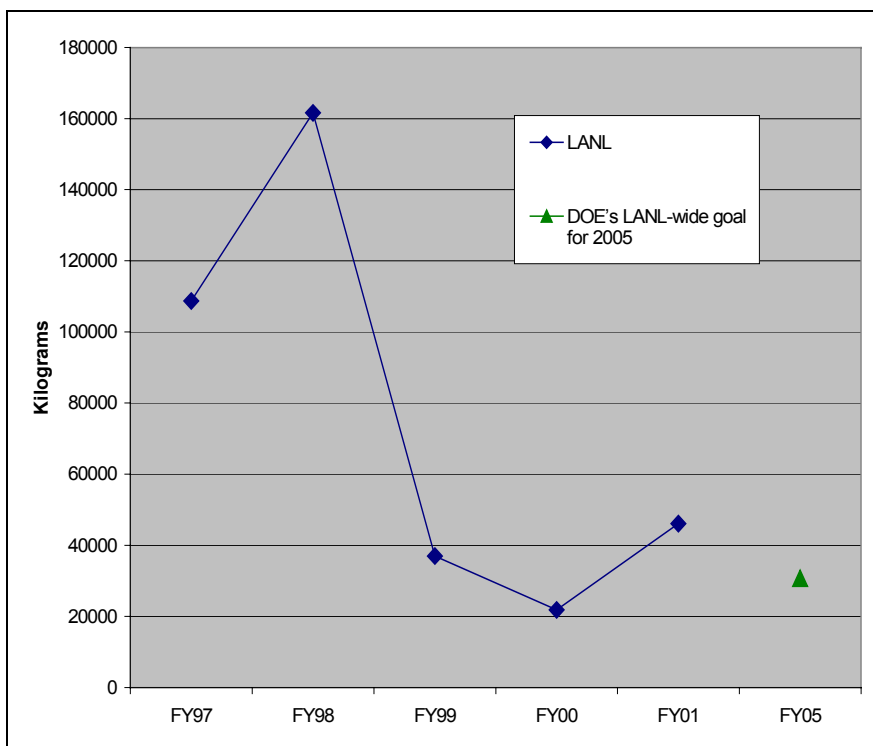


Figure 7-4. LANL hazardous waste generation results.

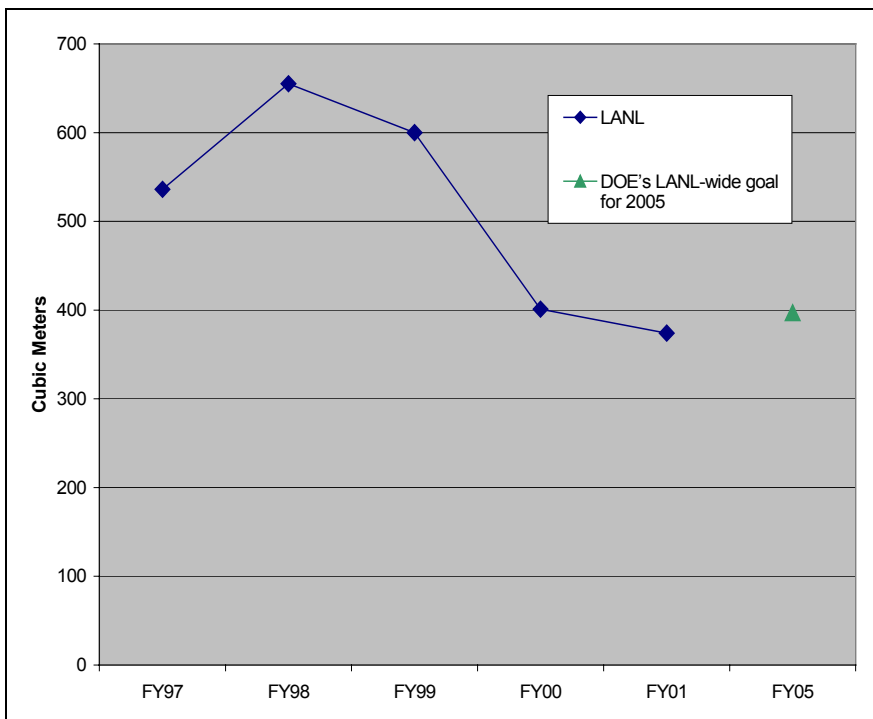


Figure 7-5. LANL low-level waste generation results.

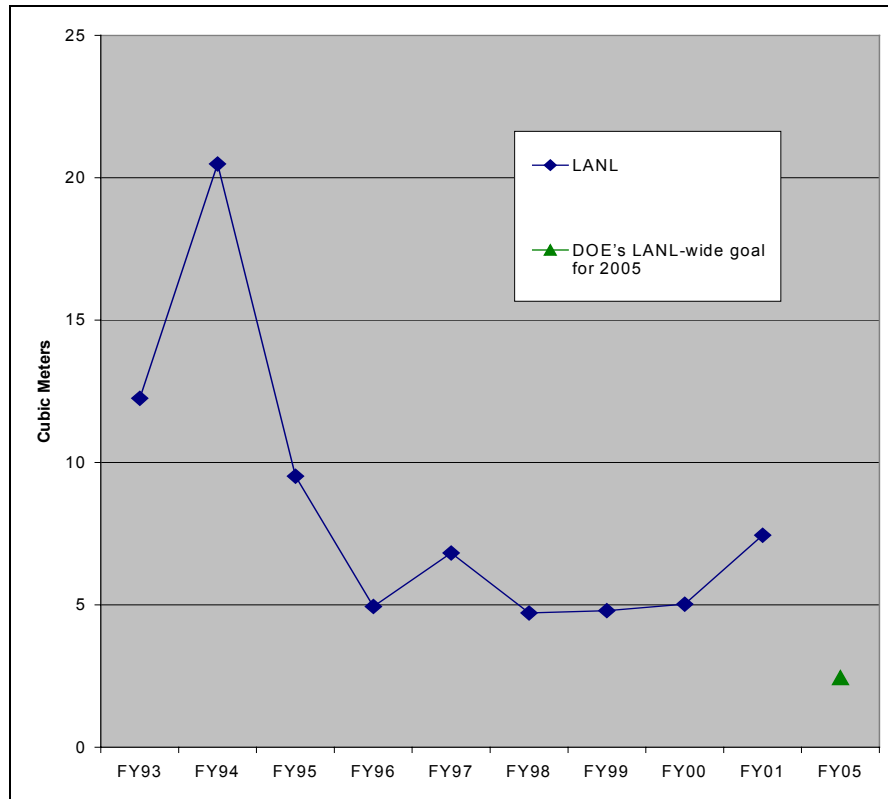


Figure 7-6. LANL mixed low-level waste results.

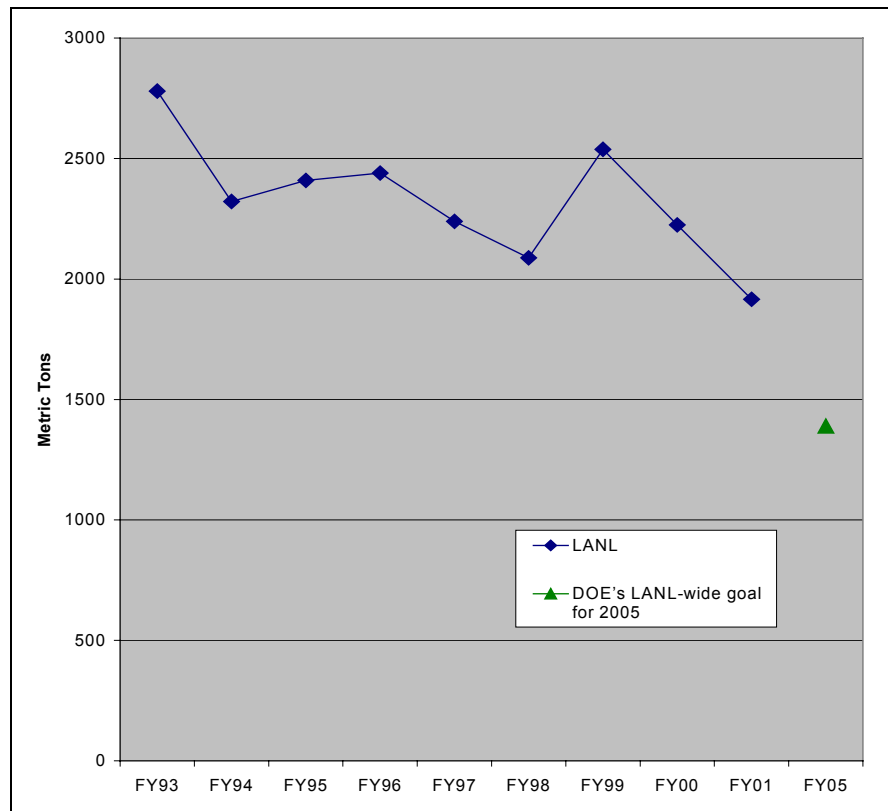


Figure 7-7. LANL solid sanitary waste generation results.

The LANL-wide recycling rate for solid sanitary waste was 41% during FY01 and 75% during the first quarter of FY02. The Laboratory appears on track to far exceed the DOE 2005 goal of 45%. LANL does not currently track recycling rates at the group level, but FMU-75 records suggest that our own recycle rates are comparable to those of the Laboratory as a whole. For example, we recycle 60% of all cardboard and 98% of metals. Recycling efforts at FMU-75 are optimized by means of segregated refuse bins for various waste streams—cardboard, lumber, metal, etc.

The AP rate called out in Appendix F is defined as

$$\frac{\text{purchases of products with recycled content} + \text{purchases of justified virgin products}}{\text{total purchases of EPA - designated items}}$$

EPA-designated items are those identified in the EPA Comprehensive Procurement Guidelines. BUS Division, which manages procurement at LANL, specifies in contracts let to vendors that any item advertised as a product with recycled content must meet the standards set forth in EPA guidelines. LANL AP rates are presented in Figure 7-8. An equally useful measure of green purchasing is the recycled purchase rate, defined as

$$\frac{\text{purchases of products with recycled content}}{\text{total purchases of EPA - designated items}}$$

LANL recycled purchase rates are presented in Figure 7-9.

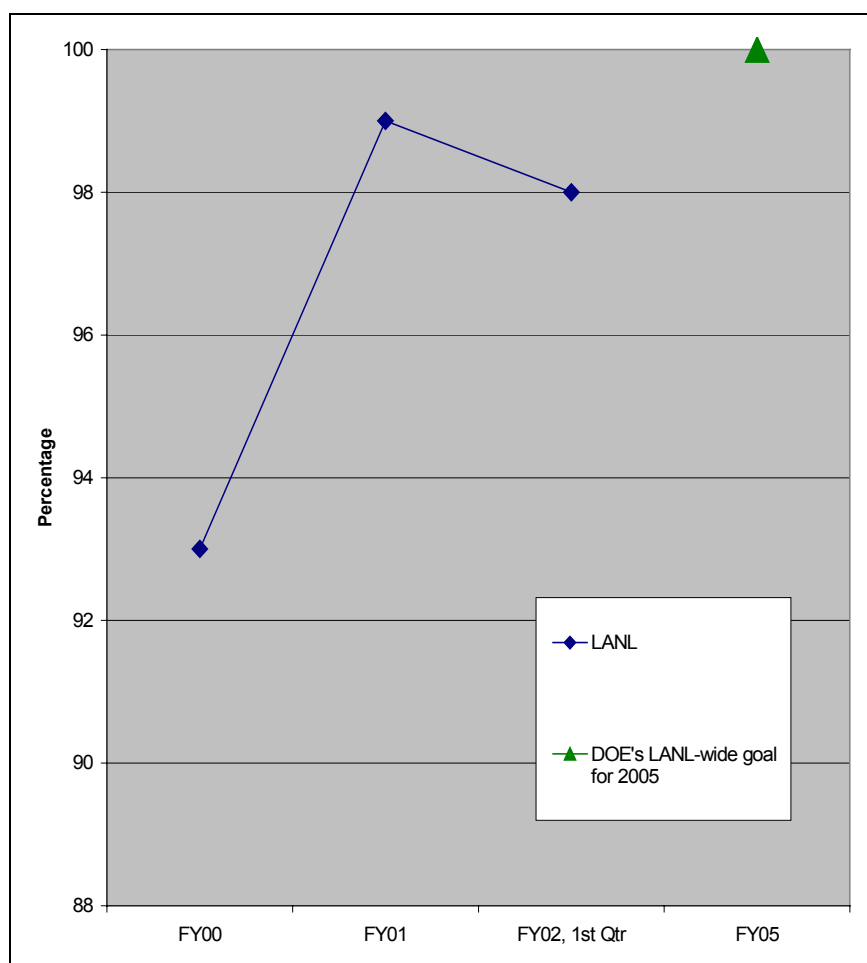


Figure 7-8. LANL AP rates.

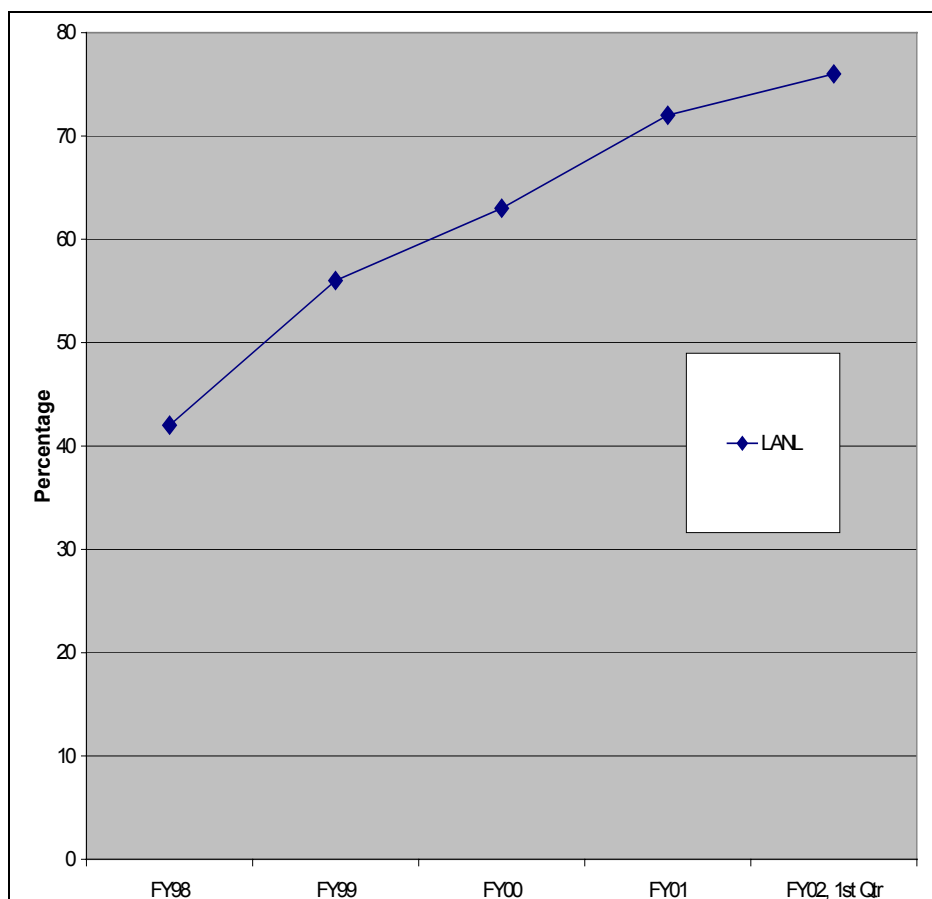


Figure 7-9. LANL recycled purchase rates.

Management walkarounds are the most direct ISM mechanism for acquiring feedback on Laboratory operations at the day-to-day activity level. In Table 7-3, we offer management walkaround results for LANL and for FMU-75. Results for all safety function tickets generated in FY01 and for environmental protection tickets generated during the same period are presented.

Table 7-3. LANL and FMU-75 ISM Management Walkaround Results

	All FY01 Safety Function Tickets		FY01 Environmental Protection Tickets	
	LANL	FMU-75	LANL	FMU-75
Number of Required Walkarounds Completed	8638	42	161	11
Percentage of Required Walkarounds Completed	90	100	N/A	100
Deficiencies Tracked/Resolved	835	4	13	0
Noteworthy Practices Shared	894	2	20	0

7.2 CUSTOMER, SUPPLIER, EMPLOYEE, AND OTHERS RESULTS

As stated above, our main customer is DOE, and the best measure of customer satisfaction with our performance is the Appendix F process.

Appendix F provision 8-1.3.a, Measuring Supplier Performance, has significant implications in the area of Laboratory-vendor relations. This POCM gages the extent to which DOE is satisfied with BUS Division's ability to manage suppliers such that the goods and services provided meet LANL requirements, including requirements with an environmental impact. It is comparable to LLNL 8-1.3, Supplier Performance, and to LBNL 7-1.3, Supplier Performance. See Table 7-4.

DOE's rating of the success of LANL's AP policy—which has important implications for vendor relations—is incorporated into the institutional score on Appendix F provision 2-1.2.c.1, as reported above in Item 7.1. LANL AP rates have also been reported in Item 7.1.

Appendix F provision 8-4.1.a, Meeting Socioeconomic Commitments, is one gage of the Laboratory's performance as a corporate citizen. This POCM registers the percentage of subcontract dollars in the following five categories: Small Business, Small Disadvantaged Business, Veteran-owned Small Business, Women-owned Small Business, and Historically Underutilized Business Zone Awards. It is comparable to LLNL 8-4.1.a, Meeting Socioeconomic Commitments, and to LBNL 7-4.1.a, Meeting Socioeconomic Commitments. See Table 7-5.

Table 7-4. Appendix F Supplier Performance Scores for Three Institutions

	LANL	LLNL	LBNL
FY99	95	95	82
FY00	95	98	82
FY01	95	95	75

Table 7-5. Appendix F Socioeconomic Commitments Scores for Three Institutions

	LANL	LLNL	LBNL
FY99	95	95	85
FY00	92	98	95
FY01	Not scored. Rating: “met.”	Not scored	Not scored

The Checkpoint Survey, conducted annually by HR Division (except for 2000, because of the Cero Grande Fire emergency) is one of our most useful mechanisms for acquiring feedback from our employees. Survey results are expressed as percentage agreement with a series of statements describing key characteristics of excellence in worker satisfaction. Table 7-6 shows selected Checkpoint Survey results for the three most recent years.

Table 7-6. Selected LANL Checkpoint Survey Results (% agreement)

Job Satisfaction Component	1998	1999	2001
LANL provides adequate training to assist me with my career development.	not surveyed	not surveyed	52
My division management seeks my opinion on important issues impacting my job.	25	24	26
I am satisfied with my involvement in decisions that affect my work.	not surveyed	not surveyed	60
My group management recognizes the value of diverse perspectives and backgrounds.	68	70	66
My group management assures a safe work environment and use of safe work practices.	not surveyed	not surveyed	89

Another useful mechanism for acquiring feedback from our employees is the Upward Appraisal survey, conducted annually by HR Division. In this survey, workers rate managers on a five-point scale. Following, we present selected Upward Appraisal results for 1998 and 1999, the most recent years for which LANL-wide results are available. See Table 7-7.

The two key indicators of worker health and safety are total recordable incidents (TRIs) and lost workday cases (LWCs). TRIs are all work-related deaths and illnesses and those work-related injuries that result in loss of consciousness, restriction of work or motion, transfer to another job, or require medical treatment beyond first aid. LWCs are the number of workdays beyond the day of injury or onset of illness that the employee was away from work or limited to restricted work activity because of an occupational injury or illness. In Figure 7-10 and Figure 7-11,

we compare LANL-wide TRI and LWC statistics with those of FMU-75. Least-squares fits applied to the LANL data series indicates that the Laboratory as a whole will achieve the Director's goal for a LANL-wide 12-month average TRI rate of 1.0 and an LWC rate of 0.5 during the first quarter of FY02. FMU-75 met the Director's goal for TRIs and LWCs during 2001 and has posted similar achievements throughout its eight years of existence.

Each year, the LANL Community Relations Division conducts a public survey to gage how community leaders in northern New Mexico perceive the Laboratory. Figure 7-12 presents perceptions—on a five-point scale, favorable to unfavorable—for the years 1998-2001. Figure 7-13 shows results from the 2001 survey showing community leaders' evaluation of LANL's posture as a corporate citizen.

Table 7-7. Selected LANL Upward Appraisal Results (disagree/agree on a 1-5 scale)

Manager Characteristic	1998	1999
Actively implements ES&H policies/procedures	4.42	4.49
Communicates openly and honestly with employees	4.01	4.14
Supports training and development for employees	4.27	4.33
Involves employees in planning and decision making	3.75	3.88
Expects employees to continuously improve	4.29	4.37

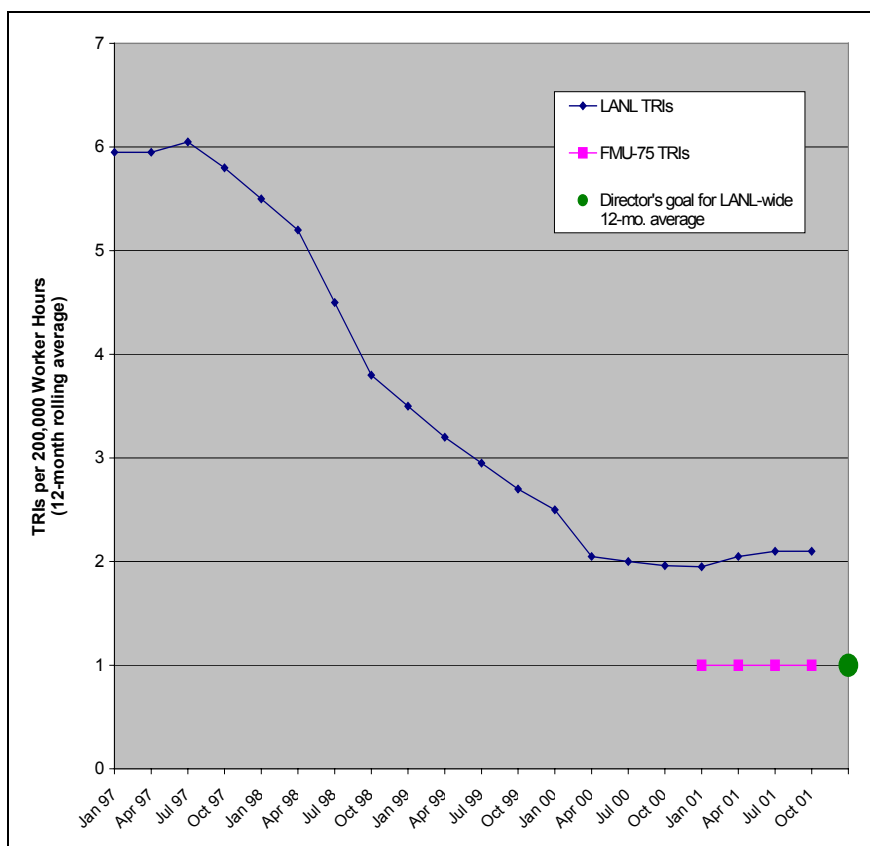


Figure 7-10. LANL and FMU-75 TRI rates.

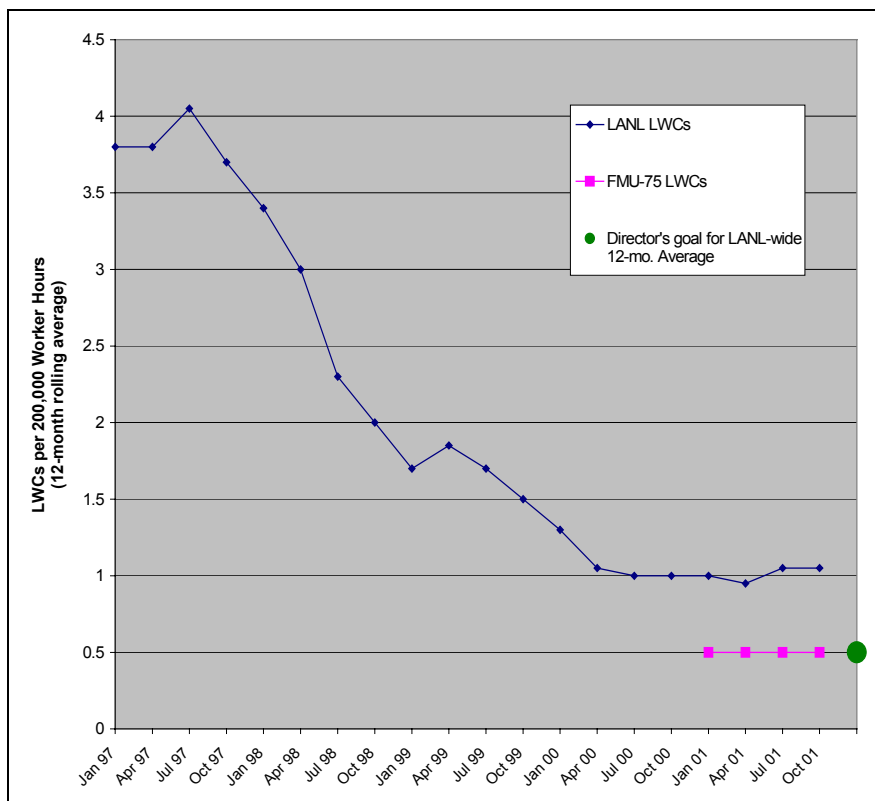


Figure 7-11. LANL and FMU-75 LWC rates.

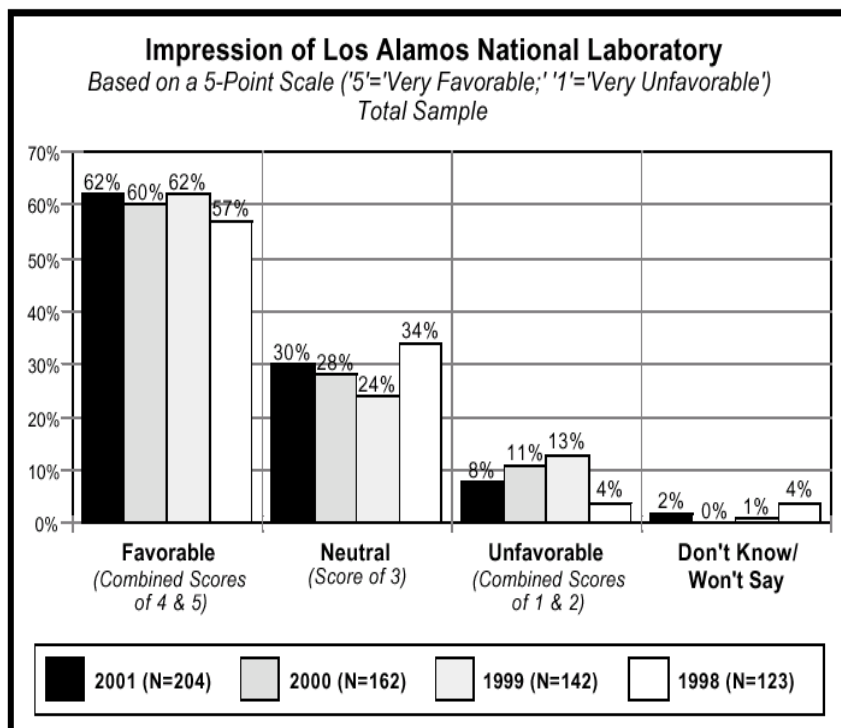


Figure 7-12. Community leaders' perceptions of LANL.

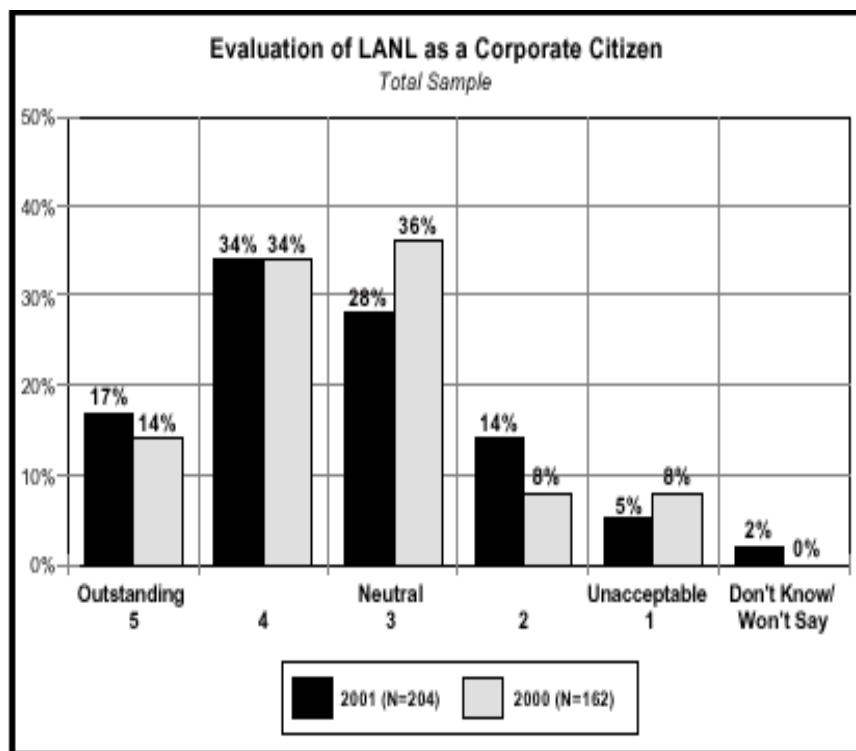


Figure 7-13. Community leaders' view of LANL's corporate-citizen posture.

7.3 FINANCIAL RESULTS

A measure of our main customer's satisfaction with the financial impact of Laboratory waste management practices is Appendix F provision 1-3.1.a, Tracking and Cost Savings. This POCM tracks and evaluates success in collecting waste chargeback information, implementing cost saving actions, and performing and implementing New Mexico Green Zia assessments. LANL's FY99 score was 85%; FY00, 78%; FY01, 82%. Appendix F of the LLNL and LBNL contracts contain a number of waste management provisions, but none correspond directly to the cost savings component of provision 1-3.1.a of the LANL contract.

An example of the impact of LANL P2 policies on our bottom line is our solid sanitary waste recycling program. The recycling rate (called out in Appendix F, see Item 7.1) was 41% for all of FY01 and 75% for the first quarter of FY02. Table 7-8 shows the revenue streams LANL realizes from recycling vs. disposal of certain classes of sanitary waste—white paper, MS A1000 junk mail, cardboard, concrete and asphalt, brush, and soil. Cost savings from these six categories of waste accounted for \$566,400 in FY01, alone. See Figure 7-14.

Financial results for certain of the FMU-75-sponsored projects mentioned in Item 7.1 include

- Boiler Water Chemical Treatment System: In addition to notable reduction in wastewater, this project saves the FMU about \$300 in maintenance costs per year.
- Roofing Shingle Redeployment: This project saved the FMU about \$10,000 in disposal costs avoided.
- Roofing Gravel Recycle: Purchase of 40 tons of gravel to pave the road and parking lot would have cost \$800. Had the roofing gravel been discarded rather than recycled, disposal costs would have run \$1500.
- Lumber Recycle: Total savings amounted to \$1500.

Table 7-8. Quantities of Recycled Material from Six LANL Waste Streams, and Associated Cost Savings

Waste Stream	Disposal Costs (\$/MT)*	Recycle Costs (\$/MT)**	Year	Amount Recycled (MT)	Disposal Costs Avoided (\$1000)	Recycle Costs Incurred (\$1000)	Costs Avoided less Costs Incurred (\$1000)
White Paper	700	388	FY99	168	117.6	65.2	52.4
			FY00	167	116.9	64.8	52.1
			FY01	217	151.9	84.2	67.7
MS A1000	700	200	FY99	204	142.8	40.8	102.0
			FY00	213	149.1	42.6	106.5
			FY01	397	277.9	79.4	198.5
Cardboard	700	266	FY99	146	102.2	38.8	63.4
			FY00	215	150.5	57.2	93.3
			FY01	319	223.3	84.9	138.4
Concrete, Asphalt	95	26	FY01	730	69.4	19.0	50.4
Brush	95	17	FY99	250	23.8	4.3	19.5
			FY00	313	29.7	5.3	24.4
			FY01	100	9.5	1.7	7.8
Soil	95	5	FY01	1151	109.3	5.8	103.6

* based on prevailing rates as of this writing

** includes direct expenses for collection and processing by LANL and haulage fees charged by consignee

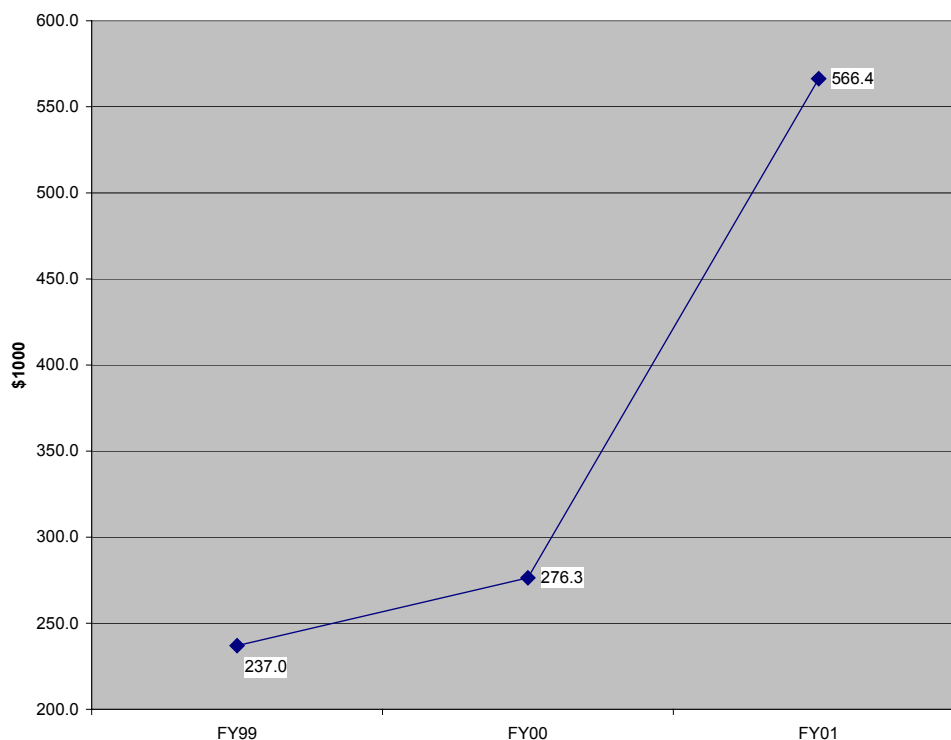


Figure 7-14. Total LANL revenues accruing from recycling vs. disposal of six waste streams.

ACRONYMS

AB	authorization basis	LIR	Laboratory Implementation Requirement
AHA	activity hazard analysis	LLNL	Lawrence Livermore National Laboratory
AP	affirmative procurement	LPR	Laboratory Performance Requirement
BUS	Business Operations Division	LWC	lost workday case
CAB	Citizens Advisory Board	NEPA	National Environmental Policy Act
CQI	continuous quality improvement	NIS	Nonproliferation and International Security Division
DOE	Department of Energy	NMED	New Mexico Environment Department
EPA	Environmental Protection Agency	NRC	Nuclear Regulatory Commission
ESH-ID	Environmental, Safety, and Health Identification	OSHA	Occupational Safety and Health Administration
ES&H	environmental, safety, and health	PA-PI	Performance Assurance Performance Indicator Group
E2	energy efficiency	PP	Prevention Program
F&IB	Feedback & Improvement Board	POCM	performance objectives, criteria, and measures
FMU	facility management unit	P2	pollution prevention
FSP	facility safety plan	RRES	Risk Reduction Environmental Stewardship Division
FWC	facility work control	SBO	Small Business Office
FWO	Facility & Waste Operations Division	SCP	Safety Concern Program
GSAF	Generator Set-aside Fee	SWEIS	Sight-wide Environmental Impact Statement
HCP	hazard control plan	SWP	safe work practices
HR	Human Resources Division	TA	technical area
IRMP	Integrated Resource Management Plan	TRI	total recordable incidents
ISM	Integrated Safety Management	UC	University of California
JCNNM	Johnson Controls of Northern New Mexico		
JIT	just-in-time		
LANL	Los Alamos National Laboratory		
LBNL	Lawrence Berkeley National Laboratory		